Food Manufacture
The Journal of the Food Industry

Vol. IV. December, 1929 No. 12

High Life.

THE BRILLIANT idea of selling a loaf of bread already sliced is said to be making headway in the Middle West. The loaf is put through a slicing machine and then wrapped in a suitable manner. Those bakers who introduced the novelty found it a remarkable "business getter," but many people are not at all happy about it and point to the greatly enhanced dangers of contamination; it has been observed that aseptic conditions are more characteristic of hospitals than of bakehouses. Somewhat similar thoughts occurred to us when we made a round of German slaughter-houses and sausage factories a few years ago; there was a world of difference in hygienic conditions between the well-lighted and beautifully tiled houses of slaughter and the underground haunts of the sausage-making fraternity.

No doubt American women will continue to hail with delight every new-fangled idea which is calculated to diminish domestic labour. As a wage-earning *pater familias* we are in complete sympathy; it was a revelation to study the hundreds of notices displayed by the various employment agencies situated along one of the main streets of New York only three months ago. From these it appeared that one would have to pay £3 a week for "houseworkers," £4 a week for "storeroom girls," £5 10s. a week for a chauffeur, and £4 a week for a "coloured porter." If you happen to be living in a very big way, sufficient to justify a full-time window-cleaner and soda man, you would have to find £7 a week for the former and £5 a week (plus meals) for the latter.

Ten years hence inventive genius will have devised the only possible means of solace for the distracted American husband. He will be able to "pop round the corner" for an XX ray treatment of the central nervous system whereby any desired state of inebriation can be procured without the trouble and expense of amateur bootlegging.

Zinc in Food.

Fairhall and Walker, of the Harvard School of Public Health, have been investigating the use of zinc-foil in the food industries from a physiological point of view. They state that zinc-foil is the latest rival of foil made from tin, lead, and aluminium; it finds increasing use in the soft-drink and confectionery industries.

The experiments of these physiologists showed that, in the cases examined, the degree of zinc contamination is relatively slight. With liquids, such as ginger ale, the amount dissolved is proportional to time, temperature, acidity, and dissolved oxygen. With solid foods it is proportional to acidity, time of storage, and temperature; but the total quantity is far less than liquid foods. "Acid drops" wrapped directly in zinc-foil and stored for two weeks retained only 4·6 parts per million of zinc. Other experimenters have shown that rats, cats, dogs, and men can breathe and ingest large amounts of dust from zinc and oxide of zinc over many years without suffering illness—amounts far in excess of what has been commonly thought to be harmful. Furthermore, it has been shown (*Jour. Biol. Chem.*, 1927, 72, 375) that the quantity of zinc which naturally occurs in food is so high that one may ingest in a single meal as much as 200 mg. of the metal, while the normal daily intake is in the neighbourhood of 15 mg.

Pickles.

At various times we have had correspondence on the subject of pickle manufacture, from which it would appear that the mechanism of salting is not clear to many. Take the "low salting" of cucumbers, using an 8 per cent. brine. By a process known technically as "osmosis," an interchange takes place between the juice of the cucumber and the brine solution; the juice, with its starches and sugars,

slowly diffuses into the brine and a lactic fermentation is set up, during which considerable quantities of carbon dioxide gas are formed. The acidity of the solution rises and the colour of the cucumber changes externally and, more slowly, internally. When curing is complete the cucumber has internally become translucent. When this stage is reached the lactic acid content will be about 1 per cent.; the salt content, due to added brine, will be about 4 per cent.; and salts from the cucumber itself will amount to about 1 per cent.

In "high salting" more salt is used; this method results in a brine of about 9 per cent. strength, a restricted lactic fermentation, and a greater volume contraction of the cucumbers. The action of brine is to draw out the juices from the cucumber and to control fermentation; the stronger the brine, the more effective is its action. The rate of acid formation is the most important point to watch, and in modern practice this is done. Temperature is an important factor in determining the rate of fermentation.

Odd Habits.

Our good friend, James Somerville, Jr., the very able American Trade Commissioner in London, declares that manufacturers abroad are much concerned over the fact that the English dislike eating in public. This unfortunate prejudice "makes hard going for American bar candy and pocket packages."

It is rather difficult to suggest a way of circumventing this attitude; no doubt a Press campaign on a sufficiently large scale would make it "quite the thing" for the "city man" to close a deal over a bar of chocolate or an attractive marshmallow. Hard-boiled goods would prove useful, on occasions, to members of the Stock Exchange, and caramels of the extra-sticky type might find favour for trapping unwary word-mongers in the House of Commons.

It is curious that chewing-gum has never really become popular over here, although Mr. Somerville believes that the demand for this entertaining product is steadily increasing. For the sake of the manufacturers we hope it will continue to increase—the advertising expenses must have been enormous—but we rather imagine that chewing and sniffing habits in crowded places are not so popular as they were in the days of the snuff-box, and that they are not likely to be revived.

Monosodium Glutamate.

In China and Japan monosodium glutamate is manufactured on a commercial scale for use as a condiment. Its flavouring power is fifteen times stronger than cane-sugar or seven times stronger than table salt. It has a strong meatlike taste. Meat diet is condemned by Buddhists, and in the Far East, and particularly in China, the large number of vegetarians creates an unusually large demand for this interesting condiment. It is used by restaurants in China in place of chicken and meat extracts, and during recent years it has been freely used like salt and sugar in the average Chinese home.

Monosodium glutamate is a sodium salt of glutamic acid, which is an amino acid discovered by Ritthausen in 1866 among the products of hydrolysis of wheat gluten by sulphuric acid. The manufacture of the salt was started in China about eight years ago, and has now attained considerable proportions, as likewise the export trade with the Dutch Indies, Singapore, etc. The most recent improvements in manufacture include the solution of gluten in hydrochloric acid at a definite temperature, the use of metallic tin as a catalyst, and the precipitation of monosodium glutamate by alcohol. Various forms of protein may be used, such as wheat gluten and soya bean. Chinese manufacturers have made no attempt to use animal protein, and they are confronted with the problem of shortage in raw materials.

Censoring Advertisements.

Dark clouds are indeed gathering! We have barely recovered from the denunciations of Mrs. Callow when we hear Governmental rumblings in the distance. Whispers credit the Ministry of Health with the intention of securing powers by which it may require all advertisements relating to food and drink to be submitted to a departmental censorship before publication.

Selective Advertising.

The excellent results to be derived from "selective advertising" were forcibly demonstrated to one of its leading advocates when, on announcing a birth in the columns of *The Times*, he received one hundred and fifty "replies" by post in the shape of folders and booklets—many printed in colours—advertising foods, cots, soap, insurance, maternity hospitals, and so on. An interesting feature was that the samples and pretty books were addressed to mother—whilst father received the financial communications.

Eat More Fish.

An American professor recently unearthed an ancient document which cited a statute of Queen Elizabeth's reign apparently on behalf of the fish traders. As might be expected, force rather than persuasion was the keynote of advertising in those days: it was a case of "Eat more Fish"—or take the consequences.

The document opened thus: "A briefe note of the benefits that growe to this realme by the observation of fish-daies, with a reason and a cause wherefore the lawe in that behalf made, is ordained very necessary to be placed in the houses of all men, specially common victuallers." The statute threatened dire penalties for those who did not observe the "fish-daies."

Early advertising was evidently based on the policy of reducing one's victim to a state of terror; he was given no choice in the matter, and had to hand over the price of a box of pills or suffer eternal torments. It is quite a plausible theory that the later generations of highwaymen took up advertising when conditions became unsuitable for the safe practice of their profession.

Truth in Advertising.

A certain remedy still uses the old, original advertisement, and after we had read of the poor man who "cast such a bad smell that he became very troublesome," and "came to such a pitch of corruption that he bred Worms"—and "Spiders and other Insects"—and how, in spite of all these terrible afflictions, he was cured, we confess to having purchased a bottle of the evil-looking concoction on the principle that if it did half what it claimed it was well worth trying for a comparatively mild complaint. Of course, we were also influenced by the claim that "This Medicine works miracles with every one, that makes use of it, and the Grace of the Omnipotent God is experienced in it to admiration." Not only that, but "it unites itself to the Stomach, and is the same as a flying Mercury." We should like to hear what the protagonists of "truth in advertising" have to say about this!

New Inventions.

It is reported that a device has been invented for listening to the interior of a grapefruit. Utilising sound amplification, as in radio, it is possible to hear a worm tearing the pulp. Fruit that is soundless is known to be sound.

Another interesting device for probing into the "innards" of things is the latest "Chemists' Fluorescence Testing Cabinet." By means of this instrument materials may be examined under ultra-violet radiation and their characteristic fluorescences yield data of considerable value to chemists and others engaged in testing work. Thus, vegetable and mineral oils can be readily differentiated and extremely minute quantities of arsenic can be detected; also, the qualitative examination of foodstuffs for adulteration is an important field of application. Recently, the apparatus was used to demonstrate to a Glasgow magistrate that the identity marks on imported eggs had been removed; as a result, a man was convicted for fraudulently removing identity marks and selling the eggs as fresh, country products.

The Sweetest Day.

For intending travellers to the States it is useful to know that October 19 is the "Sweetest Day." It is a special "candy day," and apparently one is expected to devote the day to thinking, talking, and eating candy. We hear that in a number of towns there were young ladies who won prizes for being "the Sweetest Girl, or the almost Sweetest Girl, or the almost almost Sweetest Girl." We are a little confused as to the precise meaning of this, and should be glad if anyone who happens to be over there next "candy day" will enlighten us on this point.

In New York, instead of trying to find the Sweetest Girl in the city, the committee concentrated on discovering the best lollipop-sucker. The honour fell to Miss Eileen Goehle, who now holds the title of the "champion lollipop-licker" of the Henry Street Settlement, New York. Amazing!

Events of Note.

There are two other events of note. Stefansson and Andersen, the Arctic explorers, have eaten nothing but meat for a year, and a scheme is under consideration, so it is said, in Soviet Russia to create a vast museum refrigerator capable of preserving indefinitely the bodies of human beings, animals, etc. The intention is to form a collection of the bodies of the peoples of all races and of foodstuffs.

Yeast Substitute.

A United States patent claims as a yeast-saving composition in bread making a mixture of two parts of ammonium sulphate, one part of calcium sulphate, and one part of tricalcium phosphate. This mixture is added either to the dough batch or to the yeast prior to making the dough.

Powdered Grapes.

A solid powdered grape juice has been prepared by adding dextrose to grape syrup and drying either in a dehydrator or in a vacuum dryer at a relatively low temperature, 120° to 140° F.

For preparation in a dehydrator dextrose must be added to the extent of 3 parts dextrose to 2 parts grape solids in order to obtain a solid product. A ratio as low as 1 to 1 or less of dextrose to grape solids may be used if the drying is conducted under a vacuum.

The solid after drying is a hard, brittle mass, which

may be ground to a powder in a dry atmosphere at temperatures below 70° F.

The tendency of the powder to cake in warm weather can be overcome by dusting with finely powdered dextrose, which coats the particles and prevents their sticking together.

The product has commercial possibilities in that the darkening and crystallisation problem of syrups is overcome, and it is easier to package and handle than in the syrup form.

Chocolate Manufacture.

Is the manufacture of chocolate over-mechanised? Is that massive, ponderous multiplicity of machinery absolutely necessary to the production of chocolate? Or does it represent the persistence by sheer inertia of the heavy engineering of twenty or thirty years ago into the more "concentrated," refined methods of to-day? One wonders just what quality is imparted to the product by some of these machines, and one never finds out—because nobody knows.

Chocolate by Spraying.

By means of a special atomiser, Nyrop claims that it is possible to produce chocolate by spray drying. Owing to the extraordinary fine dispersion which is obtained by the atomisation, the product possesses the necessary evenness and homogeneity, thereby saving all the expensive milling and conching operations now used in the chocolate factory.

By a modification of the manner in which cacao butter and a solution of sugar and cocoa in milk is mixed and fed to the atomiser, chocolate powders of two types can be produced. In the first case, the powder is a dispersion of sugar and albumin in fat. The product can therefore be moulded. In the second case, the powder is a dispersion of fat in sugar and albumin. A water-soluble product is therefore obtained. Chocolate can be moulded from a dispersion of sugar, albumin, etc., in fat.

Dried Butter.

By atomising in carbon dioxide, butter has been dehydrated and a paste produced which can be transported in perfect condition through the tropics without the aid of cold storage. Fresh butter can be reconstructed from this paste.

In Copenhagen fresh cream has been homogenised by a special process at such hydrogen-ion concentration that the butter fat absorbs protein from the cream serum to such an extent that the fat particles are coated almost completely when the cream has been dried to a powder. By using carbon dioxide as a drying medium (to avoid occlusion of air) it is possible to obtain powders containing from 86 to 92 per cent. of butter fat in which rancidity does not develop during storage.

Confectioners the Best Husbands.

Confectioners whose business is to woo the affections of the public on behalf of the goods they have to sell, can profit by studying the tactics of successful lovers rather than by emulating the melancholy zeal of social reformers. So we are told by America; and now we understand the extraordinary success of some of our confectioner friends! We hope that lady readers will make a note of this.

Toffee Hardness.

Although the differences in hardness between toffee and butterscotch are of great importance to manufacturers, scientists appear to have given but little attention to the elucidation of the phenomenon of hardness in these substances. Metallurgists, on the other hand, have devoted a great deal of study to the nature and determination of hardness in metals. Hardness is difficult to express as a definite physical constant of a material. Thus, in the case of india-rubber, the values of the three properties which are used in the experimental determination of hardness—viz., resistance to permanent deformation and to abrasion, and resilience, are high—although rubber cannot be regarded as a hard substance.

In Professor Desch's opinion the time factor is of great importance in the manufacture of toffee and butterscotch, but in the case of these materials we have a viscous and not a plastic deformation; a plastic substance yields when a definite stress is applied, but a viscous material continues to change under constant stress.

The Chemical Dance.

Two recent social events of importance which we had the pleasure of attending were the Brewers' Exhibition and the Chemical Dance. They were in no way connected and, fortunately, did not take place on the same day. By the way, who is responsible for that dry, formidable title—the "Chemical Dance"? As a matter of fact, it was very far from being either dry or formidable; it was one of the most convivial and cheery affairs we have had the good fortune to attend. The initiated might well have expected a demonstration in the atomic theory; instead of which he would have been most agreeably surprised at the extraordinarily "light, fantastic step" of long practice and joyful enthusiasm. Amongst those who were sprightly tripping over the floor, we caught a glimpse of Professor Drummond, the well-known authority on vitamins.

The Brewers' Exhibition brought together an astonishing variety of mechanical contrivances for washing, capping, and labelling bottles. It was evident from an examination of these machines that, in the course of the short space of twelve months, important advances had been made by engineering firms.

The Utilisation of Oils and Fats in Food Production

By P. I. SMITH

Food technologists are familiar with the early history of margarine—how it was first prepared by Mege Mouries sixty years ago and utilised during the siege of Paris in 1870. The best-grade product of to-day, perfect in flavour, odour, and colour and having a high food value, marks a great advance on the crude, oily mess sold in the streets of Paris during the days of the siege.

Part III.—The Margarine Industry

FIG. 1.—Automatic Wrapping Machine for Margarine.

THE MANUFACTURE of margarine, which is in many cases equal to the most nutritious butter and often made under better hygienic conditions, is undoubtedly a triumph of twentieth-century industrial chemistry.

The Process.

Briefly it may be said that the art of margarine production consists in blending various oils and fats until a mixture of the desired firmness is obtained. The molten fats are agitated until homogeneous, then skimmed, soured milk is added, and agitation continued. The mass then is chilled and finally cut in slabs. The market product must be a perfect emulsion of milk serum in fats, and contain no air bubbles. Flavour must on no account be unctuous or tallowy, but a close resemblance to butter—the colour the same as dairy produce and odour almost nil. Again, margarine must be almost identical with butter in food value, and one firm of manufacturer—*i.e.*, Planters' Foods, Ltd.—guarantee their vitaminised margarine to equal the finest butter in food value.

Some idea of the machinery involved in the manufacture of margarine may be gained from Figs. 1, 2, and 3. One type of emulsifier, into which the mixture of oils and fats and the pasteurised milk soured to the correct degree of acidity are led, is illustrated in Fig. 2. This is a jacketed cylinder fitted with blades rotating at 1,000 to 1,500 r.p.m. The emulsified product is then sprayed between two rotating drums, internally cooled with brine (Fig. 3). The solidified emulsion is scraped off the drums and is stored in a warm room for several hours to "ripen." Kneading operations are then carried out in rolling mills of different types, followed by a final blending and the addition of salt in mixers. The finished margarine is then cut, weighed, and packed by means of a series of automatic machines (Fig. 1). These photographs were supplied by Planters' Foods, Ltd., and *The Industrial Chemist*.

At one time solid animal fats were used to a very large extent in the manufacture of margarine, but the tendency to-day is all towards the substitution of these fats by hardened, hydrogenated vegetable oils and fats; in fact, some producers advertise their wares as made entirely from nut oils. It should be remembered, however, that vegetable oils and fats contain very small quantities of the vitamins A and D, though none, except olive and linseed, seem completely devoid of them.

The most important of the oleaginous materials used in the industry are coco-nut and palm—kernel oils, cotton seed, arachis, soya, rape, sesame, oleo oil, and general nut oils and solid animal fats.

Before attempting to describe the principles of margarine manufacture, the writer intends to consider the raw materials used in the process.

Oleo Oil.

This is the expressed oil from refined animal fat (not mutton). The washed and cleaned lumps of fat are hardened by immersing in ice-cold water or storing in a refrigerator. It is then shredded and finally melted in large tin-lined or aluminium steam-jacketed vessels at a temperature of 45-50° F. The

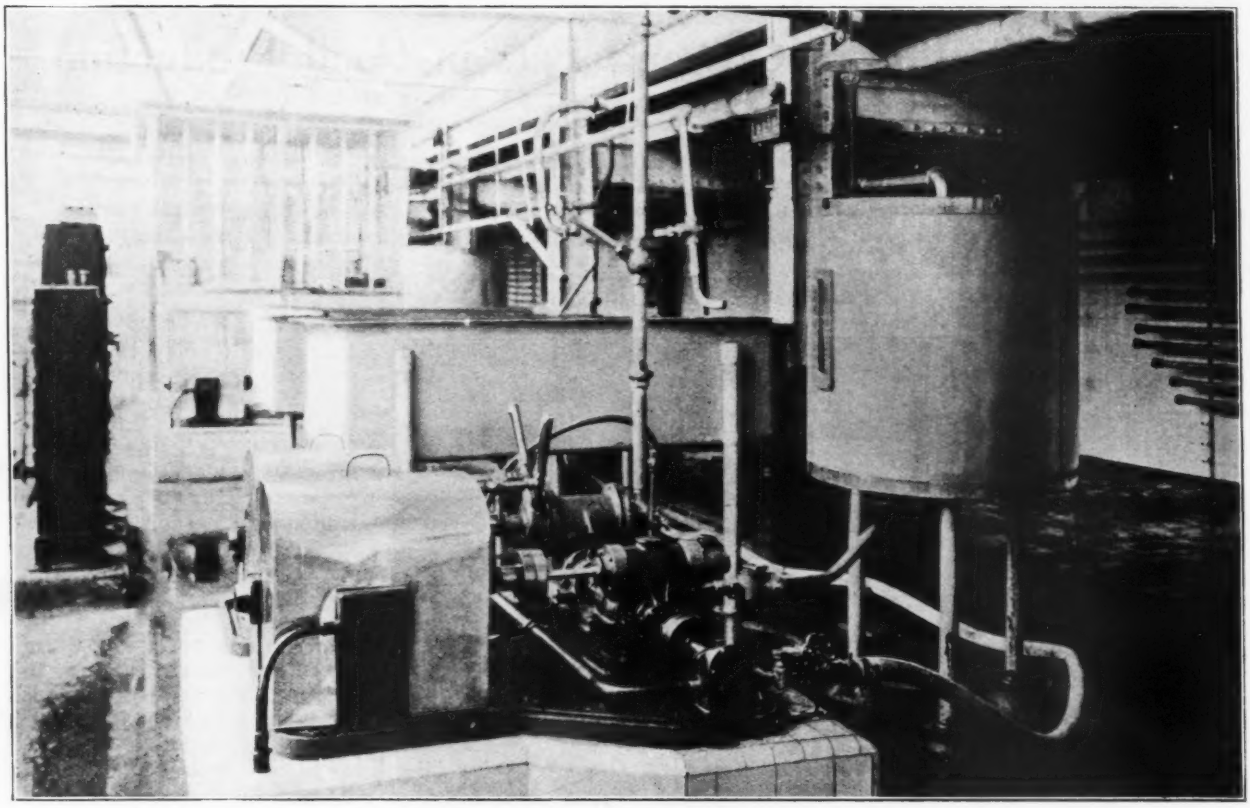


FIG. 2.—Continuous Emulsifier with Feeding Tanks and Pump.

clear melted fat is separated from the connective tissue, membrane, cartilage and bone, collected in large shallow trays, and cooled in special refrigerators. At this stage the fat is known as "premier jus." The usual practice is to cut up these slabs of fat into small squares, pack them in clean, strong canvas, and then subject them to the pressure of a hydraulic press. This expressed oil is allowed to settle, then remelted, skimmed, cleared and cooled and finally pressed. This process can be repeated three or four times, according to the degree of purity desired. Salt is generally added to the "melt" to facilitate clearing.

Lewkowitsch writes: "In large works the clear fat—*i.e.*, after remelting and clearing—is allowed to run into wooden vats, in which it stands for three to five days at a temperature suitable for the crystallisation of the stearine."

The fat employed is mainly beef fat from the kidneys; lard is not used in this country.

O. Rosenheim and T. A. Webster (*Nature*, 1927, 440) state that the liver fats of herbivorous animals such as sheep, calf, and ox contain as much as ten times the amount of vitamin A as Newfoundland cod-liver oil. They advocate the inclusion of these fats, together with a small proportion of irradiated ergosterol, in the blend of oils and fats for margarine manufacture.

Only the freshest animal fats are used in margarine production. It has been shown that rancid fat is unsuitable for food purposes, because of its ability to destroy Vitamin A in admixed foods.

Vegetable Oils and Fats.

Cotton-seed oil is largely used in the margarine industry, also as an edible table oil and for adulterating olive oil, etc. It is now expressed in large quantities in America and Europe. The seeds of the cotton-trees vary appreciably in the percentage of oil.

Lewkowitsch, in *Oils, Fats, and Waxes*, gives the following figures:

Kind of Seed.	*Kernels.*	*Husks.*	*Oil from*		
			Whole Seed.	*Kernels.*	*Husks.*
	Per Cent.	Per Cent.	Per Cent.	Per Cent.	Per Cent.
Egyptian (1899)	60·0	40·0	21·98	37·41	
Egyptian (1900)	60·06	40·0	23·93	38·7	0·67
Mersyne ..	44·4	54·8	18·67	37·44	1·2
Bombay ..	51·0	49·0	20·56	39·28	1·08
American ..			23·46		

The crude oil contains a remarkable ruby-red colouring matter, which sometimes makes the oil appear almost black. The process of refining is a most important concern. It is usually achieved by shaking the oil with a 5 per cent. solution of pure

caustic soda. The mixture is left to separate into two layers—the supernatant oil and the colouring matter. Temperature should be about 100 to 120° F. The soap formed by mixing the alkali with the oil carries down the colouring matter, leaving the oil pale straw coloured—amount of alkali used must be just sufficient to cause "incomplete saponification." The purified oil is then run off, washed with water, then stored. For edible purposes no compound bleaches can be employed.

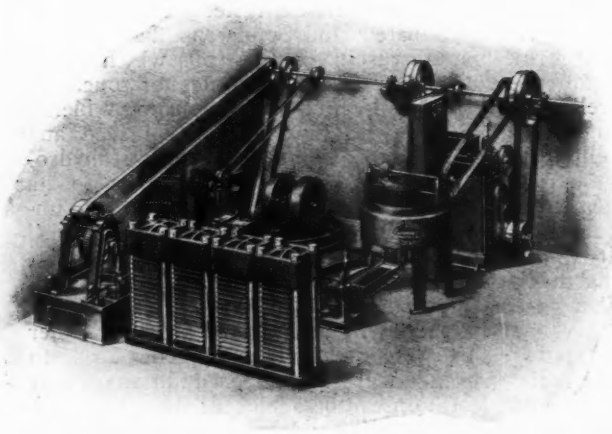
Cotton-seed oil is a semi-drying oil, and, according to Allen, has a specific gravity of 0·922 to 0·930; saponification value, 191 to 196·5; and iodine value, 106 (Hubl). Lewkowitsch gives the unsaponifiable matter as from 0·73 to 1·64 per cent. It consists to a large degree of "non-crystallisable colouring matter" and phytoserol. "Cotton-seed stearine," a light yellow-to-white fat of buttery consistency, is obtained as a by-product of the original oil by cooling and filtering, then pressing the residue. This material is used in the manufacture of margarine, especially in the United States. According to Allen, the specific gravity of cotton-seed stearine is 0·8684; melting-point, 40° C.; saponification (Lewkowitsch), 194·8 to 195·1; and iodine value, 89·8.

Hydrogenation.

Cotton-seed oil is now treated with hydrogen under special conditions for hydrogenation or hardening in order to convert it into a firm and solid fat and destroy its characteristic taste. This process, discovered by Sabateir and Senderens, has enabled margarine manufacturers to utilise oils which in the ordinary course of events they would not touch, as well as produce an all-vegetable margarine by blending vegetable oils with hardened cotton seed and other oils—solids, fats. The mechanism of hydrogenation is worth devoting a short space to its description. A vast number of oils and fats are unsaturated—that is, they possess a "double bond." It is possible to render them fully saturated by treating them with hydrogen under considerable pressure, at a raised temperature, and in contact with exceedingly small amounts of finely divided nickel or other catalysts. The atom of hydrogen attaches itself to the carbon atom under the above conditions. Any degree of saturation can be achieved; thus, whale oil can be changed into an odourless and practically tasteless solid fat, though the smell returns later, at least to some degree. The nature of the catalysts used by present-day manufacturers is kept a close secret, but the tendency seems to be in the direction of rare metals in the colloidal state (Paal) and also nickel carbonyl. Needless to say, the hydrogen used during the hardening process must be perfectly pure, as impurities poison the catalysts and act injuriously on the oils.

The use of hydrogenated oils in the margarine industry in place of oleo-margarine has been patented by Deveaux (Fr. Pat. 458,611 of 1913).

FIG. 3.—Set of Cooling Drums for Cooling the Emulsion.



Modern Four-Press Anglo-American Oil Mill for Crushing and Expressing the Oil from Linseed, Cottonseed, etc., requiring once Pressing only.

(Courtesy of Rose, Downs and Thompson, Ltd.)

Nut Oils.

Under the heading "Coco-nut Oil Group" a number of oils and fats are generally discussed; the most important from our point of view are coco-nut and palm kernel oils. Dealing with the latter first.

The palm kernel oil is extracted from the kernels of the palm-tree fruit after the important palm oil has been recovered. The kernels are shipped to Europe, where the oil is expressed.

Besides its great food value, coco-nut oil has other advantages. Thus, the addition of the oil to margarine "melt" raises the saponification value and lowers the refractive index, by which it makes margarine more akin to butter.

Refractive index of butter: 1·4590 to 1·4620 at 25° C. (butyro-refractometer scales, 49·5 to 54).

Refractive index of margarine: 1·4650 to 1·4700 (butyro-refractometer divisions, 58·6 to 66·4).

Saponification value of butter: 221 to 223 mgm. KOH.

Saponification value of margarine: approx. 189.

Nordlinger (*J.S.C.I.*, 1895, 585) gives the following percentage of oil obtained from the palm kernels collected at different sources:

Origin of Palm Kernels.	*Proportion of Fat.*
Sierra Leone	48·6
Liberia	49·4
Island of Sherboro	46·7
Grand Bassa	50·2
Congo	47·4
Loanda	50·9
Calabar	50·9
Togo District (German)	52·1

There are three "principal" varieties of palm-trees—ordinary palm, and small-fruited and large-fruited Lisombe (Preuss, *Der Tropenpflanzer*). Lewkowitsch mentions that Fendler (*Berichte d. pharm. Gesellsch.*, 1903, 115) has examined four varieties of palm fruits locally known as De, De-de bakui, Se-de, and Afa-de; oil obtained from the kernels, 4·37, 49·1, 49·2, 45·5.

Palm Kernel Oil.

Palm kernel oil is white and possesses a pleasant taste and smell. The most important analytical characteristics are as follows: (Allen and Fendler) specific gravity, 0·9119; saponification value, 248·8; iodine value, 14·9; free fatty acids calculated as oleic acid, 7·39 per cent. Palm oils generally contain a large percentage of free fatty acids; Armstrong and Allan (*ibid.*, 1924, 43, 216 T.) have published figures recording that nearly 20 per cent of the acids consist of stearic acid.

Coco-nut Oil.

Coco-nut oil is the fat expressed from the kernels of the coco-nut, of which there are many varieties.

Lewkowitsch mentions Cochin (Malabar) oil as having the finest quality.

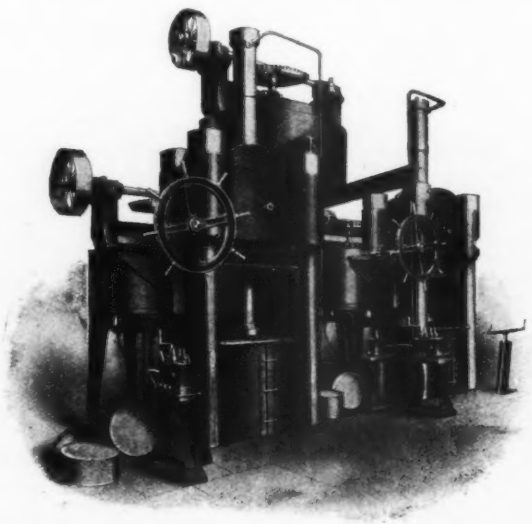
The oil as we know it in this country is a solid white fat. It possesses a pleasant smell and an unctuous or bland taste. Lewkowitsch gives the following physical and chemical constants:

Specific gravity, 0·9259; melting-point, 20° to 28° C.; saponification value, 257·3 to 268·4; iodine value, 8·9 per cent.

Like palm oils, coco-nut oil contains a large amount of free fatty acids; thus, according to Crossley and Le Sueur (*J.S.C.I.*, 1898, 991), 5 to 17·7 per cent. free fatty acids in terms of oleic acid are present in the various species.

Only the purest neutral oil is used for food purposes. Besides its utilisation in margarine manufacture, it is sometimes sold as "vegetable butter," either by itself or admixed with palm kernel oil. During the refining of these edible oils, treatment

(Continued on p. 367.)



"Premier" Cage Type Hydraulic Oil Press for Copra, Castorseed, Groundnuts, or other Seeds Rich in Oil.

(Courtesy of Rose, Downs and Thompson, Ltd.)

The Modern Jam Factory

The following is intended to give some idea of the plant that is now available for equipping a jam, jelly, or marmalade factory on up-to-date lines.

A VISIT to a modern jam factory equipped with an imposing array of plant, machinery, and scientific instruments of control would astonish anyone who had been accustomed to look upon jam-making as a back-kitchen pastime. The progress made by this branch of industry during the past few years is little short of revolutionary. As carried out in the up-to-date factory, the process is completely mechanised, every single operation is under scientific control, there is practically no handling, and hygienic conditions are above reproach.

The following notes and illustrations refer to the Kellie-Yates System, and this serves to exemplify the most recent advances made in the equipment and lay-out of the jam factory of to-day. Compare this with the steam-pulping tubs, the various crude arrangements for gravity filtration of juice through jelly bags, the hydraulic fruit press, and other cumbersome equipment of a decade ago!

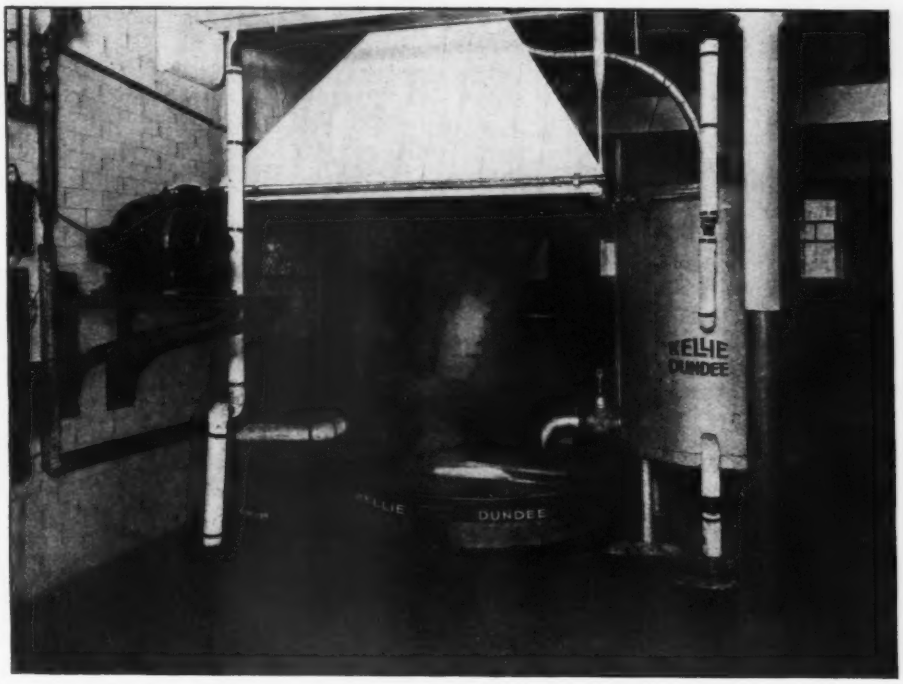


FIG. 1.

In centre is the top of Sugar Melting Pan; on right is Calibrating Tank. The end of the Filter Press for sugar syrup is in the background.

Jar Washing.

Starting at the beginning, the first operation in the up-to-date factory turning out jams, jellies, and marmalades, is the washing of the empty jars, and this is carried out in a *Washing Machine*. As the jars slowly travel through the machine on an endless steel band, they are subjected to a multiplicity of jets of hot soda solution forced through a series of perforated pipes by means of a centrifugal pump. In this way, dirt and labels are effectively removed. Three-fourths of their journey through the machine, the jars are thoroughly rinsed with hot, clean water. The labels are collected in special receivers, and, owing to the final temperature, the jars dry off as soon as they are delivered from the machine, thus obviating the use of a special drying machine. Another point worthy of note is the fact that all sizes of jars can be fed into the machine either simultaneously or successively, as desired. Sterilisation is, of course, carried out at the same time. It is claimed that with two girls feeding and two girls examining and discharging, the standard machine will wash 25 gross of 2-lb. dirty return jars per hour.

By means of a special charging system, which is automatically operated, the pans for boiling the jam, jelly, or marmalade are charged with sugar and fruit juice in accurately weighed amounts (see Fig. 4). In the case of jams, the fruit is added by hand, as this is still the only satisfactory method. Let us see how the sugar and fruit juice are prepared for delivery by pipe-line to this automatic charging plant.

Sugar Syrup.

Take the sugar department first. Here we find plant for the preparation, filtering, and inversion of the sugar syrup (see Figs. 1, 2, and 3). Sugar is thrown into the *Melting Pan*, which is preferably arranged for speedy charging so that its open mouth is about 15 inches above floor level (see Fig. 1), whilst its base is above the *Receiver*, or Blow-up, which stands on the floor below (see Fig. 2). The Melting Pan is a large steel pan, fitted with a heavy stirring gear and a closed copper heating coil to obviate condensation. Alongside the Melting Pan is a cylindrical *Calibrating Tank* (see Fig. 1), by means of which an accurately measured volume of pre-

heated water can be delivered into the Melting Pan. Situated quite near the Melting Pan and Calibrating Tank and above the Receiver is the *Filter Press* for filtering the sugar syrup. (It is obscurely represented in the background of Fig. 1.) Compressed air is used to force the syrup from the Receiver through the Filter Press. To remove all foreign matter and to assure brilliance and perfect clarity in jellies and marmalades is the function of the Filter Press. From the Filter Press the syrup passes into the *Syrup Storage Tanks* situated below (see Fig. 2), and these tanks are connected by pipes to the Charging System illustrated in Fig. 4, and to which reference has already been made.

Into two copper tanks, which constitute the *Sugar Inversion Plant*, hot, filtered syrup is blown, heated to the appropriate temperature, and allowed to stand until the inversion of the syrup is complete. The tanks are connected to the Charging System by pipes.

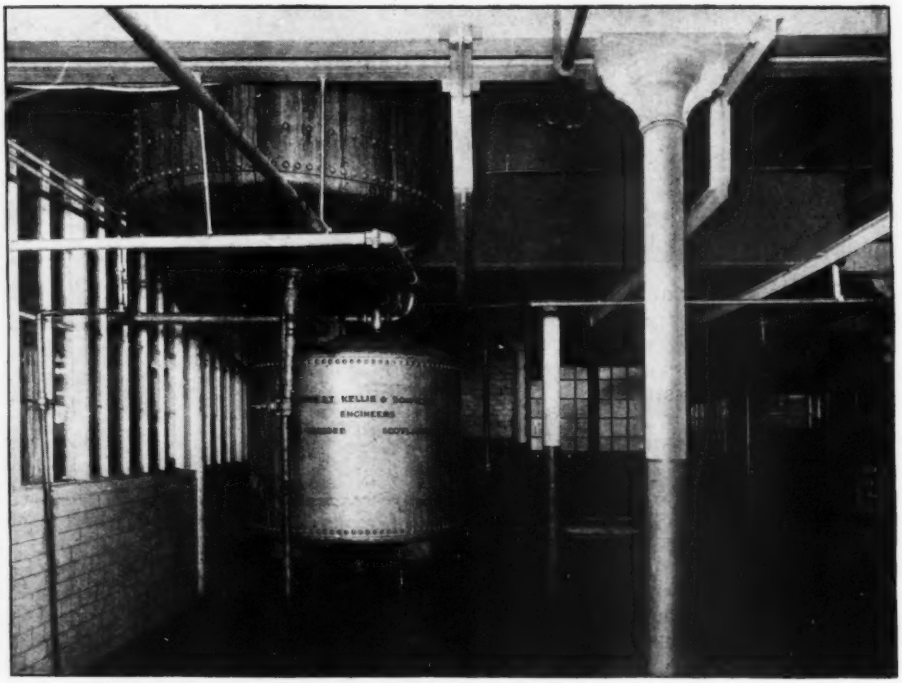


FIG. 2.

Above, on left, is the base of the Sugar Melting Tank; below is the Receiver for sugar syrup; and above, on the right, is the Overhead Storage Tank for the filtered syrup.

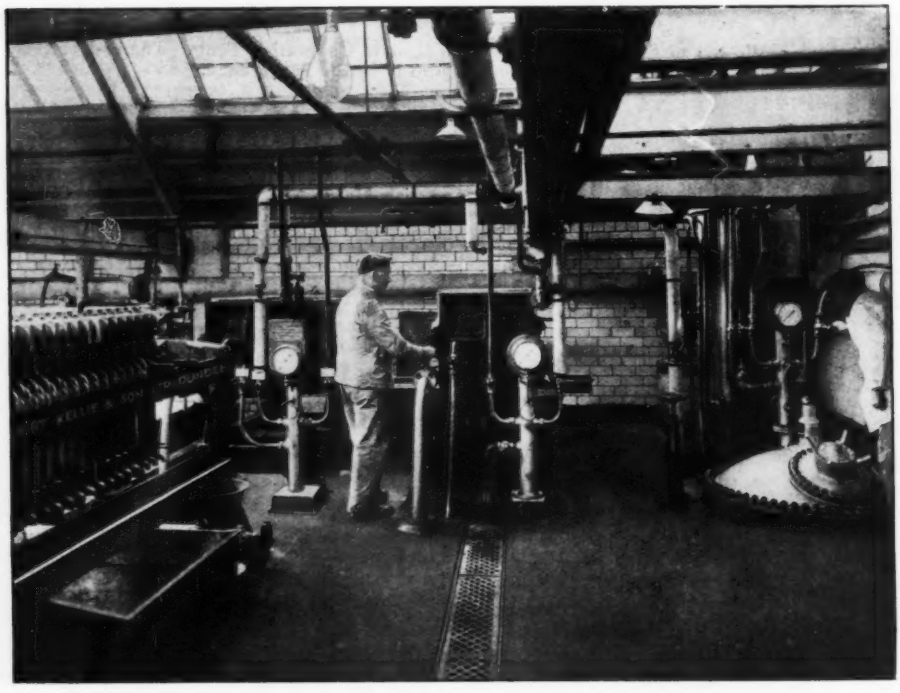


FIG. 3.

On right is the top of the Autoclave for cooking fruit and the Calibrating Tank. The Filter Presses for pulp and juices are shown on the left.

Fruit Juice.

We next pass into the juice department. Fig. 3 shows the top of the *Autoclave* (right-hand side of photograph), in which the fruit is cooked and prepared. It is a copper, steam-jacketed pan fitted with pressure gauges, a stirring device, a manhole for filling, and connections for steam, water, and compressed air. Alongside the Autoclave is a cylindrical *Calibrating Tank* for measuring and pre-heating the water. Conveniently nearby is a pulp or *Coarse Filter Press* (see Fig. 3), through which the fruit pulp is forced from the Autoclave by compressed air. The hot, crude juice then runs into a cylindrical, copper *Receiver* arranged below the Filter Press. Here a small quan-

tity of Kieselguhr is added and mixed by a stirrer. Compressed air is applied to the Receiver, and the crude juice is forced at an even rate through the *Fine Filter Press* (see Fig. 3), which extracts the whole of the solid matter and delivers a perfectly transparent juice to the juice *Storage Tanks*. The advantage of this system over the old-fashioned method of boiling and of filtering through jelly bags is obvious. With this modern system one man and two women can produce about 7 tons of juice a day, which will give a jelly or marmalade production of about 9 tons a day. Another matter of importance is the efficiency with which the fruit pectin is extracted.

FIG. 4.—A Battery of Rapid Jam Boiling Pans being Mechanically Charged by the Automatic Charging System shown on the Right.

The Charging System.

Returning now to the *Charging System*, where the filtered solutions of sugar and fruit juice, together with fruit for jam-making, are assembled, we find that this consists of a cabinet (see Fig 4) upon which are four sets of automatic weighing scales provided with special taring arrangement. On each of these scales a copper tank is fixed, each with a radial, self-grinding sluice valve. Above each of these weighing tanks there is a pipe with handy valve controls. In front of the tanks is a copper trough, and below this is a conical copper receiver provided with dual steam and compressed air arrangements.

The object of the four scales is to provide means for weighing the sugar syrup on one scale, the invert sugar on another scale, and two kinds of fruit juice on the other two. When these ingredients are weighed separately and accurately, the operator opens the valves of each of the tanks and allows them to run down a common trough into the conical receiver. Attached to the receiver is a delivery pipe, which runs over the rapid boiling pans. Along this pipe, over the centre of each pan, is fixed a two-way valve.

Jam Boiling Pans.

Fig. 4 shows a battery of *Pans* specially designed for rapid boiling. They are stationary (not tilting), and are discharged by a radial self-grinding leak-and-drip-proof sluice valve at the bottom. In addition to a copper steam-jacket, the pans are provided with an internal live steam copper coil. This system of rapid boiling is conducive to a better-flavoured jam and economical production. It is stated that a battery of five pans will turn out from 250 to 300 pans a day. Counting the girl operating the Charging Plant, the operators required are three with jelly or jelly marmalade and four with jam.

Important Announcement

IT is the policy of FOOD MANUFACTURE to render to its wide circle of readers in each branch of the industry the most useful and helpful service possible, to study the interests and requirements of its readers, and to meet these in the most effective manner.

In pursuance of this policy, we beg to announce that in future each issue will have permanent sections reflecting the noteworthy movements taking place month by month in every branch of the food industry. These regular features will be written by experts. The first appears in the present issue, and others will be added in the near future, so that ultimately each issue of FOOD MANUFACTURE will give a complete survey of the entire field of manufacturing foodstuffs.

A further development which will prove of great assistance to readers is that the body of the journal, while not departing from its customary features, will include special articles, the subject matter of which will be determined by seasonal or topical considerations, or by special events such as exhibitions. In this way each section of the industry will be given special consideration just when it is most desirous of having all the information available concerning progress in general and noteworthy developments in particular.

Readers are advised to file their back numbers of FOOD MANUFACTURE, particularly as the Index classifies for convenient reference the notices of Current Literature that have appeared during the past twelve months.

The Concept of "Colloid" and its Importance for the Food Chemist

By DR. W. CLAYTON,
Chief Chemist and Bacteriologist, Messrs. Crosse and Blackwell, Ltd., London.

Part III.—Graham's Colloids—Carbohydrates

CERTAIN CARBOHYDRATES, notably the starches, dextrins, gums, and agar-agar, are typical colloids in the Graham sense and are of great importance in food chemistry. They are emulsoids, swelling in water, yielding viscous "solutions," and are little sensitive to electrolytes. The molecules are particularly large—*e.g.*, Samec gives 100,000 as the molecular weight of starch.

Starch.—Dry starch granules swell in cold water, mechanical disruption of the granules assisting such swelling. By intensive disintegration in cold water, Alsberg found over 60 per cent. of the starch could pass into solution. On heating with water, starch swells more intensively and gives a viscous paste. Most starches swell but do not burst in boiling water, potato starch being a notable exception, inasmuch as it disintegrates and yields a colloidal solution in which are suspended fairly coarse fragments of starch granules. In general, starch solutions after boiling contain clear granules filled with fluid. Apparently there is no correlation between the original size of the starch granule and the final swollen granule. The gelatinisation during heating is not a sudden phenomenon, but a long and gradual conversion. Modern work shows that it is the non-disintegrated granule which regulates the viscosity of an ordinary starch paste—*i.e.*, the viscosity is that of a suspension rather than of a colloidal solution, as, *e.g.*, gelatin.

A starch hydrosol (pseudo-solution in water) ages noticeably, its viscosity falling to that akin to water, and the original opalescent fluid deposits flaky starch particles, leaving a clear, slightly viscous supernatant liquid. Since starch occurs to the extent of 65-70 per cent. in wheat flour, its importance in the study of bread is unique. Indeed, the problem of the staling of bread is intimately connected with the phenomenon of the ageing of starch hydrosol. Ostwald has connected staling with the syneresis of the starch gel (gelatinised during baking)—*i.e.*, with its gradual expulsion of water. Katz believes that as the starch granules shrink on ageing, they relax their union with the gluten skeleton in bread, whereupon crumbling or hardening of the bread may result.

Starch is a protective colloid, but weakly so. Protection is measured in terms of the gold number, defined by Zsigmondy as the number of milligrammes of colloid which, after addition to 10 c.c. of standard gold hydrosol, will just fail to prevent a colour change when 1 c.c. of 10 per cent. NaCl solution is added. Thus, starch has a gold number of about 25, as compared with 2 for gum tragacanth, and 0·005–L.L. for gelatin. Obviously, the lower the gold number, the greater the colloid protective power.

Starch hydrosol has but little electric conductance and does not react with electrolytes, except that with iodine (in a solution with potassium iodide) it gives a deep blue coloured complex. By heating with water under pressure with acids, oxidising agents, and certain salts, such as KCNS, the so-called soluble starch is prepared, which dissolves readily in water to clear, slightly opalescent, solutions of viscosity much inferior to the usual starch hydrosols.

An important matter in food sterilisation by heat concerns the starch content of foods, such as soups. The rate of penetration of heat is proportional to the starch concentration up to 6 per cent. starch. Stronger starch solutions conduct heat just the same as the 6 per cent. solution.

Dextrins are prepared by heating dry starch, or starch wetted with nitric acid, to between 100° and 280° C. The product obtained varies in colour from white to brown and has a varied composition. Dextrins belong to the class of semi-colloids, being intermediate in character between emulsoids and true solutes.

Agar-agar.—This is a Japanese sea-weed product which swells in water and dissolves on heating to boiling. On cooling, a 1 per cent. solution will set at about 50° C. to a very solid jelly, which only melts above 90° C. This phenomenon of the change from sol to gel and gel to sol, taking different temperature paths, is very common in the study of emulsoids and is termed Hysteresis. The jelly is characterised by pronounced syneresis. The hydrosol is negatively charged, and the addition of electrolytes profoundly influences its viscosity—*e.g.*, barium chloride at first causes a rapid decrease and then no further change.

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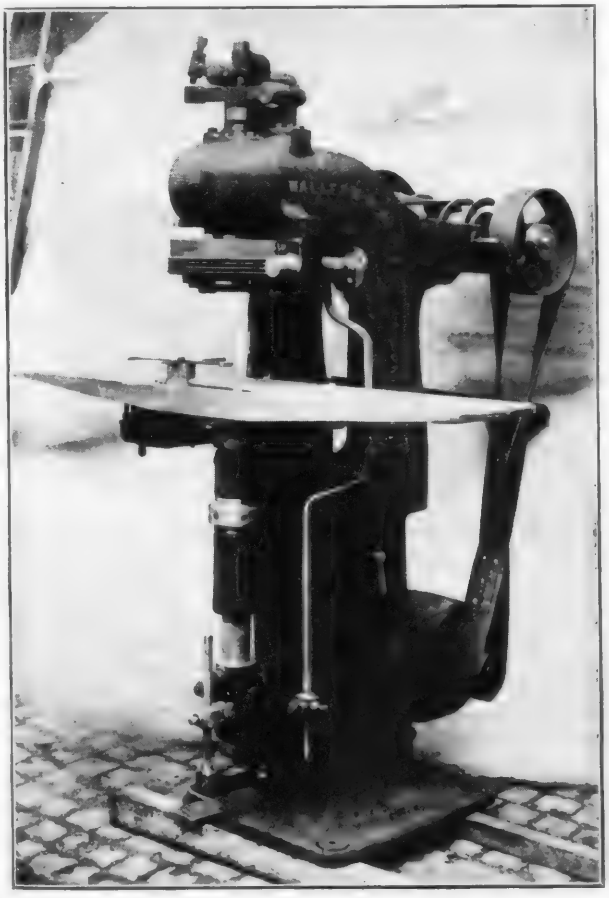
Modern Plant for Food Factories

At the request of numerous readers desiring to be kept in touch with recent progress in factory equipment, we give below some interesting particulars of various features which have lately come to our notice. We take this opportunity of reminding manufacturers of plant and equipment that this journal provides an effective means of bringing their goods to the notice of a very wide circle of users and that we are always glad to have any information from them that is likely to interest our readers.

Waller and Co., Ltd., Vauxhall Walk, London, S.E. 11.

This firm has supplied us with a photograph and description of their Standard Open Back Seamer.

This machine is not new in design, but is one of the most successful machines that we have manufactured. It is designed especially for factories where absolute reliability is essential; where the engineering staff cannot give lengthy attention to odd machines; where the variety of work has a considerable range.



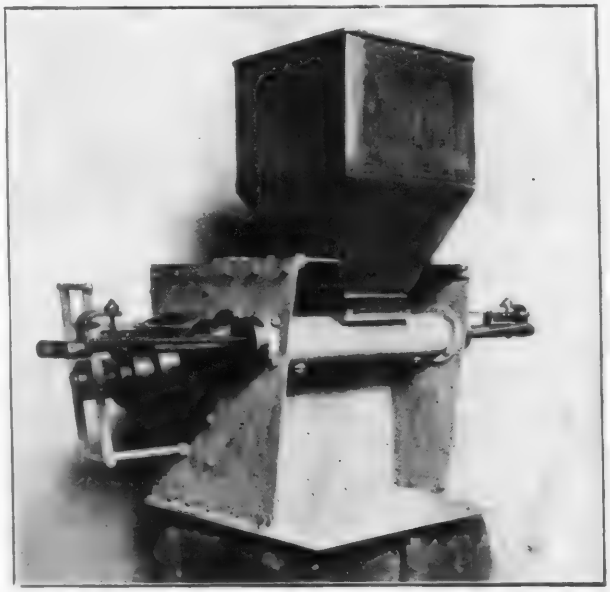
The machine in the illustration is fitted with an electric motor which enables it to be put down and driven anywhere in the factory. It is capable of adjustment over a wide area, and the adjustments are simple and can be readily understood and easily performed. Beyond this, the chief feature of the machine is the speed at which it works. The tins are placed on the supply table, which is set so that it is just above the bottom chuck when the pedal is depressed.

The tin is then brought up to an adjustable guide, which centres the tin in the centre of the bottom chuck, and when the pedal is released registers the tin on the top chuck. The seaming operation is now carried through, both seaming wheels passing the chuck.

On depressing the treadle to release the tin, the guide makes a movement which discharges the tin through the back of the machine and returns to its original position. By this means the finished tins are delivered at a distance away from the unseamed tins, and this has a beneficial effect on the output of the machine.

S. Briggs and Co., Ltd., Burton-on-Trent.

This firm makes an Automatic Filling Machine for foodstuffs which is capable of being modified in design so as to deal with products of any particular consistency. Machines are, for instance, made for filling honey, syrup, oils, malt extracts, etc.



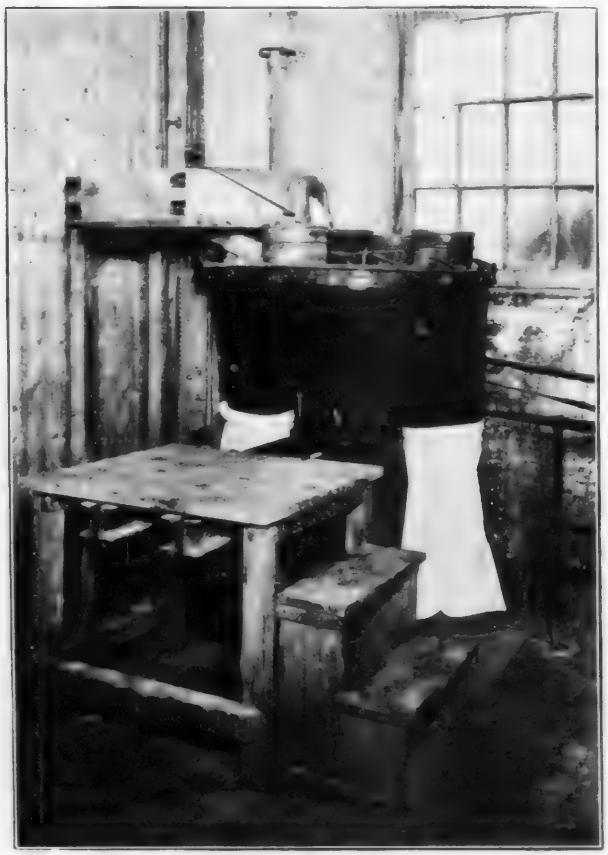
The action is absolutely definite—*i.e.*, purely mechanical—and does not depend upon delicately

balanced parts. The machines are easily adjustable to fill various-sized containers.

Buffoline Noiseless Gear Co., Ltd., Chelsea, London, S.W. 10.

Although not exactly novel, having been on the market for several years, the Kek Mill is ever finding new uses, and, due to improvement of design, this mill is now able to handle a greater variety of materials than formerly.

In the manufacture of certain foodstuffs the Kek



Mill has opened up possibilities not formerly available to the producer. Certain products demand the finest possible reduction with the minimum generation of heat.

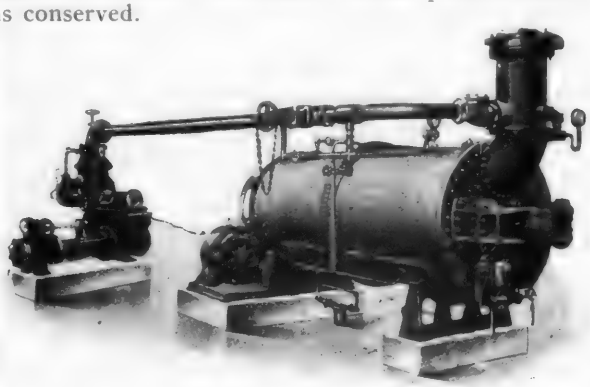
Among these may be mentioned icing sugar, milk powders, and patent foods. These can be reduced to the finest state of division or intimately blended without the use of screens of any description.

The Kek Mill is essentially a high speed, intercalating pin type of mill, but amongst recent improvements are discs without pins, which have been designed and developed especially for the emulsification of such materials as creams, etc.

For works where it is desirable to use one mill for various products, this machine is invaluable, owing to the ease and quickness with which it can be cleaned. It is possible to clean thoroughly and be ready for use again in ten minutes.

Industrial Waste Eliminators, Ltd., London, W.C. 1.

This firm specialises in plant for the utilisation of the by-products of bacon factories, abattoirs, fish-curing works, meat-packing factories, and kindred undertakings. One of their most successful machines is the "Iwel-Laabs" Patent Melter, which is illustrated below. Its principal applications are (1) for rendering lard and edible fats; (2) for rendering and treating non-edible fats, bones, offal, trimmings, bacon and ham rinds, stock-pot residues, etc.; and (3) for treating and utilising condemned meat, carcasses, and organs. The method used is one known as "dry rendering," whereby the material under treatment is cooked or rendered under pressure generated by its own moisture. In this way, preliminary crushing or cutting is obviated, and the material rapidly breaks up, irrespective of its nature and size. The machine is a steam-jacketed cylinder fitted with an agitating shaft and arms. The escape of the steam generated within the cylinder by its release from the material is retarded, by means of a valve, sufficiently to create the pressure required for breaking up the particular raw material under treatment. Thus simultaneous rendering, drying, and sterilisation are accomplished. It is claimed that the whole of the valuable, soluble protein matter is conserved.



Mather and Platt, Ltd., Manchester.

The illustration here figured is a novel device, known as the Grinnell Thermolier, which is being largely adopted for heating industrial and commercial buildings. It operates on the principle of "unit-heating"—*i.e.*, releasing a large amount of heat in a small space and then distributing this heat widely, through movement of the air. Very efficient radiating surfaces are employed, and a rapid air circulation is arranged over these. The radiating surfaces are themselves so small that when the rapid air movement is stopped only a negligible amount of heat is dissipated. By this unit-heating principle, heat is supplied instantaneously and is automatically controllable. The cost is claimed to be substantially less than cumbersome piping systems with central or automatic control.

This firm also makes the "Grinnell Duotherm Control," which is designed to regulate room temperatures where unit-heaters are installed and to provide for normal temperatures during working hours and low temperatures during "idle" hours.

William Brierley, Collier and Hartley, Ltd., Rochdale.

Below is illustrated the Fruit Peel Chipping Machine made by this well-known firm, who have supplied the following particulars.

The original idea for this machine was evolved by Mr. Turnbull, who was at that time employed by one of the largest marmalade manufacturers in Great Britain. The idea was offered to Messrs. William Brierley, Collier, and Hartley, Ltd., and Mr. Turnbull joined the firm to develop the machine.

As originally conceived, this machine was a "double-duty" machine, the idea being that manufacturers could use it for chipped peel or, by slight adjustment taking a few seconds, it could be used for cutting peel from which the white is removed and the yellow portion cut into thin shreds as used in jelly marmalade.

These machines were tried out in a number of factories, but it was pointed out to the makers that it was so successful on both classes of peel that most manufacturers would not be able to use it for both purposes, as during the season they would want to use it continually on one type, and that, if it was possible, it would be better to make it into two machines. These suggestions were accordingly acted upon, and two seasons ago the two new models made their appearance. These, also, were very successful, and finally an automatic feed was designed for the Chipping Machine.

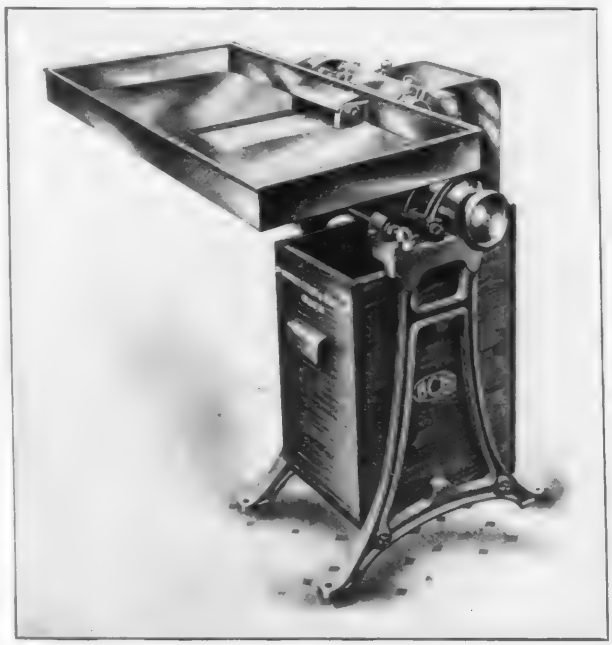
The machines were tried out at all the leading makers of marmalade, who gave the manufacturers the benefit of their suggestions and ideas as to how the machine could still be improved to meet factory conditions, and last season over sixty of these machines were supplied to the trade. This figure may not seem large, but when it is pointed out that in one factory alone, working on cooked peel, it displaces twelve of the old-type disc cutting machines and twelve operatives, it will be seen that an enormous advance has been made in cutting peel for marmalade.

At a factory visited a few days ago, we noticed six of the old machines which had been replaced by one of these, and we were informed that the only thing to do with them was to hit them with a hammer, as there was no sale for them anywhere.

The machine will not only take orange peel, either in quarters or half-caps, either cooked or uncooked, but will deal in exactly the same way with lemon peel, cooked or uncooked or from the brine, and also lemon peel and grapefruit peel. The output is enormous, and the machine takes peel as fast as it can be put on the travelling band, the machine having over 32,000 cuts per minute. In an actual test made, the machine cut 14 lbs. of cooked peel in ten seconds, although the makers do not recommend this rate of working in actual use. This equals the enormous output of 45 cwts. per hour.

One firm we know cut peel from the brine at the rate of 9 cwts. per hour, semi-cooked peel 8 cwts. per hour, cooked peel 6½ cwts. per hour, and raw peel 4½ cwts. per hour.

Not only does it displace a number of operatives, but it is also so simple that a young girl without any experience at all can feed it at the above rate, merely having to throw the peel on to the feed band.



The machine itself takes up very little space and, including the feed tray, is only 3 feet 7 inches long by 3 feet wide by 3 feet 6 inches high, and requires approximately 1 horse-power to drive.

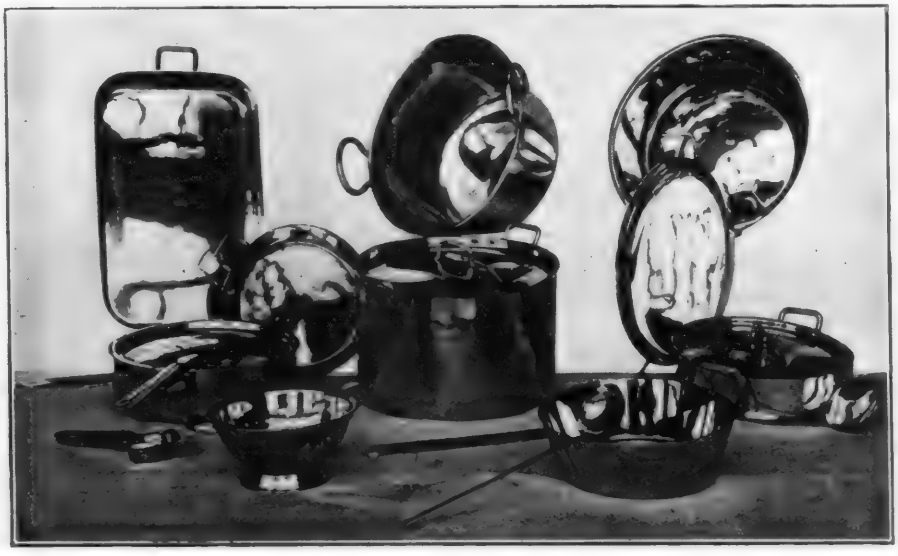
The principle of the machine is a very simple one—namely, that of the ordinary lawn mower—that is, blades set on a spiral revolving against a stationary blade. The machine is made in two ways, either in anti-acid bronze throughout or in Monel Metal throughout, and in both cases all the blades are stainless steel. One firm informed us that they had saved the cost of three machines in under six weeks.

For a machine costing only 25 per cent. more to replace six of the older type and to save practically 90 per cent. of the labour is, we think, an enormous stride in any business, and has brought down production costs very considerably, and, in addition, given a finished article 50 per cent. better than the older machines.

Thos. Firth and Sons, Ltd., Sheffield.

This firm specialises in the manufacture of steels resistant to staining, acid attack, and high temperature conditions. Some idea of the thoroughness with which this firm has devoted itself to the subject may be gathered from a perusal of the book which it has issued. This book contains the latest information on these special steels and discusses such matters as requisitioning, machinery, preparing polished surfaces, welding, soldering, physical properties, and the effect of various influences upon Firth Stainless and "Firth Staybrite" Steels. The latter finds an important and increasing use for exterior and interior decoration of shops and restaurants, for counters, showcases, and so on; also for food utensils and cooking equipment. It is claimed to bear the closest resemblance to silver and to be unaffected by all food acids, condiments, etc. Boiling fats pour clean from it, and it stands up admirably against hard wear and rough usage.

The accompanying photographs show various cooking utensils and a milk-can made from "Firth Staybrite."



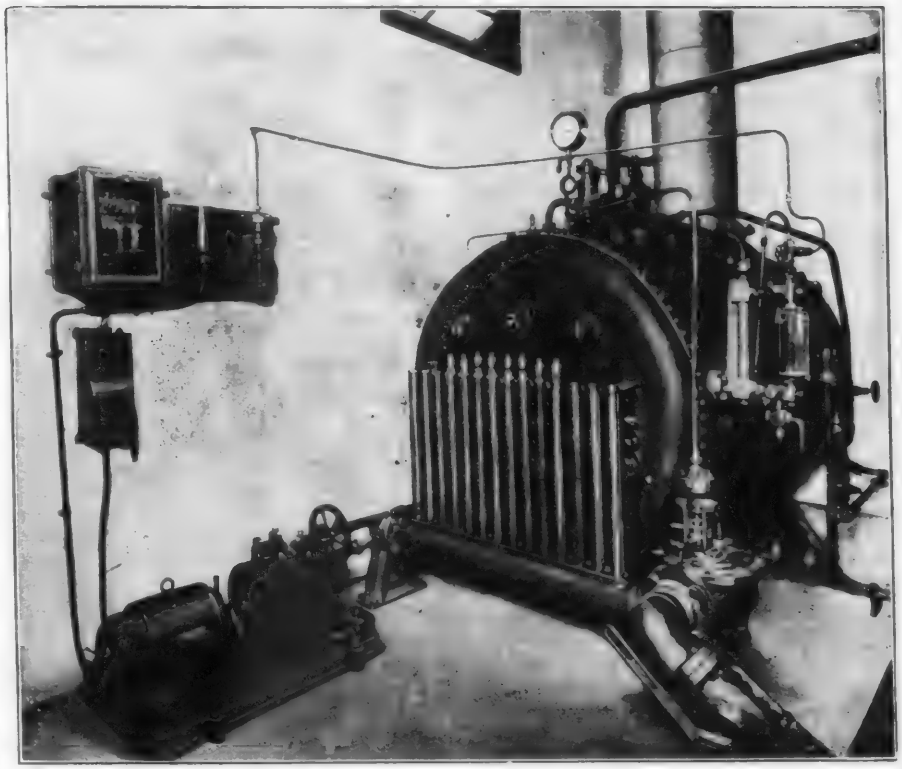
Town Gas Boilers (Bonecourt), Ltd., Grosvenor Mansions, London, S.W. 1.

The following notes have been submitted by this firm and give some interesting particulars of the "Bonecourt" Boiler.

Attempts to ensure that the highest degree of cleanliness is associated with food manufacture are often frustrated on account of the coal, coke, or ash accompanying the steam boiler. Other disadvantages of the "ordinary" steam boiler are the space required for fuel storage; labour for fuel cartage, stoking, and ash removal; atmospheric "smuts"; the low efficiency at which it operates when steam is drawn intermittently. These troubles may be overcome by the installation of a "Bonecourt" Town Gas Fired Steam Boiler, which is perfectly clean

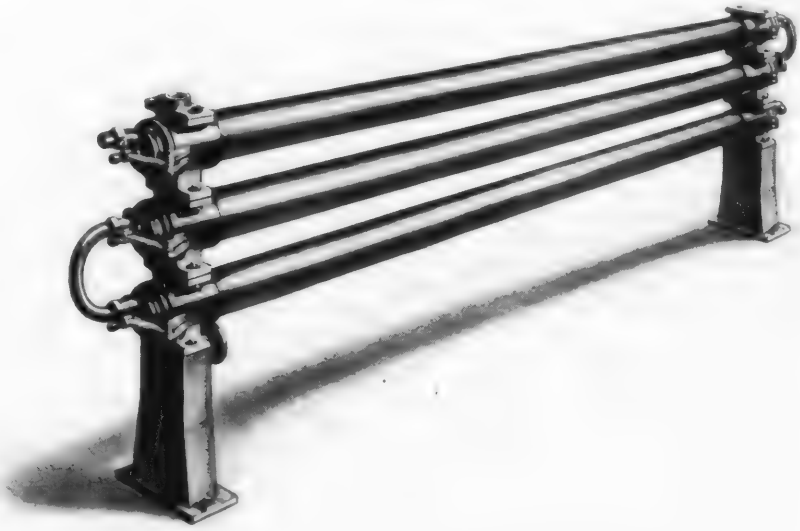
and may be entirely automatic in action. A battery of two "Bonecourt" Boilers has recently been installed in the bakery of the United Co-operative Baking Society, Ltd., Glasgow, which will be the largest and most up to date of its kind in Scotland. The two boilers (one 6B and one 3B) which have been installed are for the purpose of supplying all the steam necessary for heating, and such steam as is required for any manufacturing purpose, in a large new baking factory built for the purpose of baking fancy breads, cakes, etc. In the equipment of this new factory only electricity and gas are used for the baking ovens, power and heating purposes. No coal, coke, or fuel of a similar kind will be used in the factory. The boilers are fired by town's gas supplied by the Gas Department of the Glasgow Corporation, and are automatically controlled, and supply all their present steam requirements, but room has been left for a future addition to this installation.

The accompanying photograph shows a large boiler of this type which is completely automatic in action and installed in London for Messrs. Hooper Struve and Co., Ltd., 11, Whitfield Street, W. 1, the well-known mineral water manufacturers.



Robert Morton and Co., Ltd., Burton-on-Trent.

The following notes relate to the Morton Pasteuriser or Cooler for liquid foods, salad creams, mustard mixtures, vinegars, etc. The apparatus illustrated is a great advance on those now on the market, the utmost care being taken to eliminate all pockets or cavities, thereby rendering them particularly easy to clean thoroughly, which has always been a difficulty hitherto. The whole of the interior may be thoroughly sterilised by passing steam through the tubes, provision being made for this purpose. The internal tubes, through which the liquid to be heated or cooled passes, are made in nickel, monel metal, stainless steel, tinned copper, or other metal, according to the nature of the liquid cooled or heated. The end caps, giving access to the internal tubes, are attached to the apparatus by means of hinges, a simple central screw only being required to make an efficient joint when closed. An advantage claimed for these pasteurisers is that of being able to increase or decrease the capacity as desired by adding or removing sections or units.



Protecting the Consumer: A Reply to Criticism

By A. BARBARA CALLOW, M.A., M.Sc., M.S.,
Author of "Food and Health."

LAST MONTH'S FOOD MANUFACTURE contained an article by me called "The Selling Price of Truth." In this article I suggested that the consumer should be told the ingredients of manufactured foods and that misleading labels should be abolished. I asked food manufacturers to consider the possibility of telling the truth about their products. Four and a half pages of criticism promptly appeared. I was told that truth is usually an abstraction, not a concrete fact. I was told that few have the urge to seek out absolute truth. I was told to beware lest enthusiasm for truth should lead me to a frenzy. I was given to understand that truth is suitable only for "scientists of the pure school," "single-track" persons, and Pirandello. I am not sure what is meant by "single-track" persons, but I gather it is something dreadful, because I am one of them. All food manufacturers are, *ex officio*, multi-track persons. The Editor has about a hundred tracks. If you do not believe me, read the November Editorial. It states that Mrs. Callow drives into the wilderness along a straight and narrow road and is for ever digging at the bottom of the well of truth. No single-track person can mix metaphors like that.

Jam and Cocktails.

But although truth is merely an academic abstraction with no practical value, my critics paradoxically assure me that food manufacturers care a great deal about the truth. According to Mr. J. Valentine Backes, if more pectin is added to jam than the natural fruit should contain this fact is carefully stated on the label. Moreover, as Mr. F. E. Thomas points out, the pectin is not added to cheapen the jam. Certainly not. Pectin is added to bought jam merely to preserve the natural flavour of the fruit. Mr. Thomas appears to consider that the flavour of bought jam is as delicious as that of home-made jam. But he gives himself away completely. He is hoist with his own petard. He admits that he belongs to a section of society (perhaps I should say Society) whose members are incapable of making jam at home. The housewife prefers golf to work, and the cook's chief job is mixing cocktails. Fortunately this undesirable group is fast dying out. We have Mr. Thomas's assurance that, as far as his experience goes, bearing babies is quite out of fashion. There are, however, other sections of society. Mr. Thomas may be interested to know that there are thousands of women in England who bear bonnie babies. There are thousands of women in England who have never tasted a cocktail. There are thousands of women in England who make excellent home-made jam.

The Age of Food Manufacture.

I am, however, quite prepared to admit that good cooks are rapidly diminishing in numbers. The changing conditions of modern life allow fewer and fewer opportunities for home-cooking. Kitchens get smaller and smaller, and it is increasingly difficult to obtain satisfactory domestic help. Even the best housewives are compelled to buy more and more foods ready-made. It is the Age of Food Manufacture. The manufacturer has it all his own way. There is no Consumer's Protection Society. It is for this reason that I venture to voice the consumer's point of view.

If we are to live mainly on manufactured foods we must have some idea of their composition. At present, in most cases, secrecy reigns. New methods of food preparation are continually introduced, but the consumer is not told what effect the new procedure will have on the nutritive value of the food. There have been cases when the introduction of a new method of food manufacture has led to unexpected and disastrous results. The classical case is the story of the introduction of milling machinery into the East. Everyone knows that rice has for centuries been the staple food of the poorer classes in such countries as Japan and the Malay States. In olden times, when native or domestic mills were used, the resulting rice had anti-neuritic properties which effectively protected rice-eating peoples from the ravages of beri-beri. When Western methods of milling and refining were adopted, beri-beri became increasingly frequent because highly refined, polished rice does not contain the anti-beri-beri vitamin. This is an extreme case, but it serves to show the dangers to which the public are exposed.

Standards and Definitions.

Mr. Thomas thinks that housewives do not like to know the truth about the food they buy. This is unfortunately true in some cases, but I should like to tell Mr. Thomas that there is an increasing number of housewives in this country who take an intelligent interest in the subject of nutrition. Newspaper articles, wireless talks, lectures, and popular books have done a great deal to educate the public People have begun to realise that ill-health is frequently caused by unsuitable food. Modern parents are especially interested in food because they want their children to be as healthy as possible. I have heard it said that modern advertising is responsible for a great deal of malnutrition, because parents think that they are giving their children certain articles of diet when they are really giving them something quite different. An eminent doctor the other day, in a letter to *The Times*, stated that there is an article on the market called sago which is not sago at all, but potato starch. He pleaded for authoritative definitions and standards of purity, and said he

(*Continued on p.* 361.)

Review of Essential Oils, Colours and Flavourings

Lemon Oil.

THE SITUATION with regard to lemon oil promises to be a very difficult one during the coming season, and buyers will soon have to settle their policy for 1930. It is advisable, therefore, to consider fully the conditions prevailing in Messina before arriving at a final decision.

Last year's lemon crop was short, and there is no "carry over" in Italy. The new prices will therefore be quite independent of unsold stocks. Most of last season's oil has now been delivered to the merchants, and immediate prices are largely controlled by individual holders. There is no new crop oil available in November, and any offers of such are entirely fictitious.

This year's lemon crop is exceptionally abundant, and will probably be 30 per cent. above normal. The weather conditions in Sicily have been very favourable for lemon growing, and the rain came at the right time for swelling the fruit. Lemons will therefore be plentiful this year, and the season will be a little earlier than usual. The crop will be sold to the various contending interests. The packers will probably take the first selection, and the quantity bought by them will depend largely on the London market for fresh fruit. The demand for lemons is generally very considerable during the month of December, but it is not anticipated that the consumption of the fresh fruit will exceed that of previous years. The surplus fruit is utilised chiefly for making citric acid, and, to a smaller extent, for the extraction of the juice for squashes and soft drinks. The skins left over from the latter operations are pressed for the oil or are disposed of in other ways.

The pressing season is in full swing early in January and ends about Easter-time, when all the mountain-grown fruit has ripened. A small proportion of oil, however, will be extracted in December, but this is generally used for sampling purposes. It is possible that some small parcels will arrive in England during December, but the bulk will not reach this country until the end of January or the beginning of February.

The situation with regard to hand-pressed oil is changing very rapidly in Messina. Last year only about 40 per cent. of the total pressings were genuine sponge oil, the remainder being machine extracted. Many new machines have been bought on the hire-purchase system during the present year, and the percentage of hand-pressed oil will therefore be considerably diminished this season.

Machine-extracted oil is inferior in quality to the sponge-pressed variety, due to the method of extracting, and the demand for the hand-pressed product for blending purposes in Messina is very considerable. The quantity of genuine sponge oil exported is comparatively small, and this is mostly bought up by the blenders. The genuine article rarely reaches the consumer.

Last year's prices for oils of all kinds were abnormally high, and many users substituted other flavouring agents for the lemon essence. Some have permanently abandoned the use of lemon oil or have considerably reduced their consumption. Others have turned to cheaper oils, such as the Californian and Spanish products, and all these facts will have an influence on next year's markets. Machine-made oil will be abundant and the prices will probably be lowest during the months of January and February of 1930, when supplies are plentiful and when cash is needed in Messina. An attempt will probably be made to force up prices during the spring and early summer months, and the ensuing situation will be controlled by the 1930 crop as soon as this is in sight.

The genuine sponge-pressed product will cost about 1s. 6d. per lb. more than the machine-made oil during the early part of the season, but very little will be exported in its virgin state. Competition will increase as the season advances, and it is reasonable to suppose that the hand-pressed variety will become dearer. Most of the so-called sponge oil is blended, but all oils are valued according to their worth, and in no other way.

We draw the attention of readers to the announcement on page 349.

Fibre Containers and Food Preservation*

FIBRE CONTAINERS are usually looked upon as shipping containers only. Actually, they are fulfilling an increasing and very important mission as food preservers. The general term "fibre containers" is here considered to include the new and important "cracker caddy" as well as the better known corrugated and solid-fibre shipping cases. Some of the more important fields in the realm of food preserving which have been successfully entered by these containers include:

Fresh fish (frozen).
Refrigeration by the "Dry-Ice" process.
Biscuits and crackers.
Fresh fruit and vegetables.
Butter and oleomargarine.

Perhaps the two outstanding characteristics of most of these containers, which have contributed much to their success in the food-preserving industry, are the high insulating value of corrugated board and the exceptional moisture and grease resisting qualities of caddy board. Insulation is extremely important in the shipping of frozen foods such as fresh fish and of the fast-growing list of products now being packed in conjunction with "Dry-Ice." Moisture-proofing and grease-proofing are equally important in the shipment of bakers' products, as well as of many other commodities susceptible to changes in moisture content.

The most efficient insulation medium known is dead air. Analysis of any of the important thermal insulators will establish the fact that their value depends upon the more or less minute cells of dead air that have been trapped in the structure of the insulating medium. A similar examination shows that the flutes of double-faced corrugated board also consists essentially of dead air cells, and the sealing off of these cells is accomplished by the folded flap creases at the top and bottom of the box. The American Society of Heating and Ventilating Engineers (*Journal*, vol. 26, No. 7, October, 1920, p. 647) has shown that corrugated board stands high in the scale of efficient insulators, ranking higher than 85 per cent. magnesia. This valuable property can be augmented to almost any extent by the addition of one or more layers of corrugated pads and liners.

For instance, pre-cooled fresh fish is now being shipped by express and parcel post in corrugated boxes, without icing or external refrigeration. One of the secrets of the modern pre-cooled fish industry is extremely rapid freezing, which keeps the cells of the flesh intact. The slower methods of the recent past permitted the formation of relatively large ice crystals that ruptured these cells and thus spoiled the flavour. By the modern method the minute crystals cause no damage and the flavour is the same as with fresh fish, even after long periods of time, provided the fish stays frozen in the interim. It is the function of the corrugated box to guard this low temperature during transit.

"Dry-Ice" is frozen carbon dioxide gas, having a temperature of fourteen degrees below zero. It possesses the remarkable property of passing directly from the solid to the gaseous phase, skipping the liquid phase entirely. Here is a marvellous refrigerant, therefore, combining very low temperatures with exceptional cleanliness, to say nothing of its well-known preservative qualities from a chemical standpoint. "Dry-Ice" is, of course, more expensive than is ordinary ice, but its valuable properties have already assured its successful use, as is evidenced by the rapidly growing list of industries that are using it. Chief among these are perishable luxuries, such as ice-cream, Eskimo Pie, and others of like nature, but other fields, such as fresh meats and other packers' products, are conducting intensive experiments with it. Here, again, corrugated shipping cases and specially designed folding boxes have been found to be the logical containers.

Insulation, however, does not always apply to heat and cold. In food preservation it is often fully as important to prevent the passage of moisture and grease. Soda crackers, for instance, begin to lose their crispness with even the slightest absorption of moisture. Conversely, marshmallows harden very quickly if allowed to dry. These and similar goods are manufactured under the very nicest of atmospheric balance, and the maker must demand a package that will deliver his goods in just the right condition as regards moisture content. Long and painstaking research has shown that refined, odourless asphalt is the best commercial medium for preventing the passage of moisture in either direction.

Similar work has developed modern glassine paper, which has the power of resisting grease penetration to a remarkable extent. This is important in the packaging of biscuits and bakery products containing a high percentage of shortening (short bread) or cocoa butter (sugar wafers). The practical answer was the development of "cracker caddy board," having an inner liner of glassine paper and a buried layer of asphalt, the latter so applied that no pinholes or other leaks are possible. Originally developed for the biscuit and cracker industry, this caddy board was rapidly adopted for such products as bulk candy, ham and bacon, pretzels, cheese, nuts, and cigars.

Besides insulation, food preservation is aided by prevention of bruising. This is especially true of fresh fruit and vegetables, although the insulation of pre-cooled fruits is also a factor. The cushioned walls of corrugated board are valuable here, and a large and increasing tonnage of apples, citrus fruits, and vegetables is now moving in these containers.

* *J. D. Malcolmson, "Food Ind.," 1929, Jan., 160-161.*

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Marketing English Food Products in Japan

By GEORGE CECIL

Although a steady demand exists in Japan for canned foods, especially soups and meats, lack of enterprise on the part of English food manufacturers allows this potential market to remain undeveloped.

JAPAN, OR "NIPPON," as the patriotic natives like to hear their country termed, has marked her vaunted progress by manufacturing canned goods. The Mikado's dearest wish is to see only Japanese-made comestibles sold, and, to this end, all patriots are requested to support home industries. The people, however, while greatly attached to Japan and its virtuous ruler, draw the line at products of bad quality. Manufacturers, in their feverish desire to flood the market with a low-priced article, have paid no attention to quality. Nor, for that matter, are they capable of doing better, ignorance of manufacturing methods standing in the way. The Japanese, though intelligent, aim too high.

Hak-urai-mono.

Meanwhile, superior goods being preferred by every sensible "Jap," imports are welcomed by the consumers. The Government, indignant at—what it terms—a slight upon the Emperor's clearly expressed wishes, has imposed a stiff duty. *Hak-urai-mono* (foreign-made) commodities must pay from thirty to one hundred per cent., according to their nature. Coffee, for example, is let off with thirty per cent.; but cocoa is mulct a hundred, which seems ridiculously disproportionate. Yet, in spite of this heavy *octroi*, the manufactures of the "foreign devil," as unenlightened country people call the stranger from afar, are demanded by consumers and merchants. A flourishing trade has resulted.

Although the Government rejoices at the huge yearly sum resulting from customs duty, no official dare mention the fact—unless he is anxious to lose his job. The Japan of to-day and the Japan as depicted in Gilbert's sprightly *libretto* to "The Mikado" are very much alike. Musical-comedy is the pivot on which she turns.

Imported Canned Goods.

Rice, though the national dish, is considered incomplete without an imported addition. So canned salmon finds a ready market, the Japanese adding to the layer of rice, covering the plate, a generous helping. Those who cannot afford luxuries must fall back on local manufactures; but each makes an effort to purchase the superior article. Japan produces nearly eight thousand tons of condensed milk annually; the demand being for something better, she is forced to import an equal quantity—chiefly from Switzerland. Jam, too, is highly esteemed, there being great competition amongst Western manufacturing firms to secure the market. France has entered the fray, to discover that her prices are far too high.

Where England Fails.

England, where as fine preserves as the heart of a "Jap" could wish for are manufactured, also has despatched travellers "out East." Unfortunately, some of these attach overmuch importance to watching football matches and to assuaging an ever-present thirst with whisky-and-soda. It does not occur to John Bull that working hours might be more advantageously employed in cultivating friendly relation with prospects.

British attempts to introduce goods are equally handicapped by the opinions of those who manufacture them. . . . "What's good enough for England is good enough for a native" is their slogan. Consequently, when a traveller reports that jam must be packed in a certain manner, to suit the market, and that only a certain size bottle of pickles is acceptable, the firm indignantly orders him to inform the dealers that they "can take it or leave it." If "leave it," why go to the vast expense of sending a "drummer" to so far distant a country?

The Briton must learn to "deliver the goods."

A Strange Combination.

Canned vegetable soups, meats (particularly bacon, chicken, and pork), jellies and powdered milk are always in demand, and with all classes. The receptacles bear labels with gaudy Japanese designs and English lettering, a strange combination. But if those for whom the goods are destined pin their faith to the white man's food, they remain sufficiently patriotic to demand a native setting. The legend describing the contents may be in English; the top must show the red and white striped flag of "Nippon," or a sunrise—the emblem of the fatherland. Were the flag to be a foreign one and the description in Japanese, the goods would remain unsold. Much advertising is also necessary, especially in the newspapers, most of which charge uncommonly high rates for space. Calendars, provided they are brightly coloured, prove a good investment, the populace simply clamouring for them. Like the pots and tins, the picture must be striking.

Business Methods.

The exporter's interests are best served by appointing a Japanese firm as local agents—and trusting to its not selling a rival manufacturer's goods. Trademarks should be registered in the Tokio Patents Office, for native manufacturers, being utterly without scruple, think nothing of stealing a label. The

(*Continued on p. 367.*)

Correspondence

Enquiries

72. We are seeking a herring grading plant for separating herrings of different sizes. We do not know whether such a thing exists, and should be much obliged if you would, should you know of people making plant of such a nature, let us have the names, or make some reference in your journal which would put a manufacturer in touch with us.

73. Required, a good working formula for Piccalilli and one for Sweet Pickle.

74. Could you oblige us with the address of a good firm who make felt filter bags, suitable for filtering fruit wines?

75. Wanted, the manufacturers of machines which shred suet.

76. We should be glad if you could supply us with a good commercial recipe for salad cream.

77. Wanted, names of firms making plant for producing a fine table salt.

78. Wanted, names of firms making a machine suitable for breaking down sugar-loaves into small nibs.

79. Wanted, names of firms manufacturing machinery for tablet-making from powder.

Answers to Enquiries

73. *Piccalilli* (English Style).

Following is a representative mixing for a good ordinary "mustard pickle" to suit British palates:

Make a mixture of the vegetables—cauliflower, button onions (or small Dutch silverskins for the very best quality), girkins, chopped smallish cucumbers, strips of horse-radish, Italian capsicums, green and red, which are just now in season, and possibly a few slices of firm raw tomato to impart colour and variety. Tomato need not be brined.

These vegetables are taken "from brine," which means that they are usually bought in casks from Holland and they are in a salt solution. If raw, home-grown vegetables are used, then they must be put in brine. The brine is made of salt and water sufficiently strong to float an egg. The vegetables are kept in the brine for a long time, but when needed quickly a few days in the brine is sufficient.

Slices of carrot, French beans, celery, green ginger, etc., are other additions in the better grades. Shredded cabbage is often included in the "fancy" qualities.

Put the vegetables in clean water to rinse off some of the salt (unless they are freshly brined, when this is dispensed with), then pack in the stone or glass jars and cover with the following liquor. Use white wine vinegar for best, malt vinegar for ordinary, and No. 16 Diamond vinegar for the cheapest. Or form a vinegar with 1 gall. acetic acid and 7 galls. water, or sufficient water to suit requirements. Strong vinegar is necessary unless the pickles are sold and consumed quickly.

For the liquor, to each gallon of vinegar (salt if necessary) add eight tablespoons mustard flour, four tablespoons ground ginger, two tablespoons turmeric, two allspice, two pepper, and boil up for a minute or two. Mix mustard and turmeric to a paste with some of the vinegar. Some of the spices may be in the "whole" condition and may be tied up in muslin for the boiling. A few peppers, allspice, and ginger strips are usually left in the pickle. When the spiced liquor has boiled, leave till cold or warm, then pour over the vegetables. Some makers pour it over whilst hot. Then cork or tie bladder over. In the cheaper grades, for quick consumption, wheat flour is often added, partly as a thickener and partly to economise on mustard. About 6 ozs. of flour to the gallon of vinegar is a usual proportion. And the cheaper usually contain more of the cauliflower stalk than the flower.

Dutch vegetables in brine may be had from John F. Seyfried and Sons, Ltd., 71, Eastcheap, E.C.

Soft water is preferable for making brines, etc., and water containing much iron or lime will discolour the pickles. A weaker brine does not toughen the vegetables as much as a stronger one, so it is better for them to remain longer in a weaker brine than for a short period in a strong one. Eight galls. of water and 15 lbs. salt form a normal brine. Some pickle makers test brines with a salometer.

In foreign parts, local vegetables or fruits can be used up in the pickles; in fact, practically anything edible may be included. Thus we get American and other variations called Mixed Mustard Pickles, Rummage Pickles, Medley Pickles, Chow Chow, and so on.

Rummage Pickles.—This is a sweetish fancy mix, all the vegetables being ground up. Use 3 pints small green tomatoes, 1½ pints ripe tomatoes (or 4½ pints all ripe), 2 medium sticks celery, four medium sized onions (not pickling onion size), 2 sweet red capsicums, 2 sweet green capsicums, and 1½ pints small girkins. Other vegetables may be included at will. Put the vegetables through a food chopper, sprinkle with half a cup of salt, and stand one night. Drain well next day and mix all well after adding the dressing. Stand four or five hours, then jar up. This kind is usually "processed." The dressing is done with four tablespoons salt, 1½ pints (full) of vinegar, 1 lb. brown sugar, a tablespoonful of mustard, same of cinnamon, and one smallish hot red capsicum—latter chopped up.

Fancy Mustard Pickle.—Use 1 pint small whole girkins, 1 pint sliced cucumbers, 1 pint small whole onions, ½ pint French beans, 3 each sweet green and sweet red capsicums, and 1 pint of cauliflower. The dressing is made of 1½ pints vinegar, 4 tablespoons flour, ½ pint brown sugar, 3 tablespoons flour mustard, a little turmeric, and a teaspoon of crushed celery seeds.

All vegetables should be measured in the chopped condition, tomatoes in halves or smaller, cucumbers in slices, beans in lengths or diagonally, and chop the capsicums (not chillie peppers, see remark above.)

All the vegetables should be tender. Put in brine overnight, then freshen in clear water for two hours. Next stand in 50/50 vinegar and water for fifteen minutes and then scald in the same liquor. To form the dressing, rub dry ingredients smooth, then add the hot vinegar slowly, stirring to a smooth paste. Cook and stir till thick. Then drain vegetables well, and pour the dressing over whilst hot. Mix well, pack into jars and process pint sizes at 180° F. (simmering) for twenty minutes.

The following is another reply to Enquiry No. 73:

Piccalilli or Mustard Pickles.

8 lbs onions, sliced
2 cauliflowers
16 lbs green tomatoes, sliced
16 lbs. small cucumbers

Place in salt and water for twenty-four hours. At the end of that period, remove the prepared vegetables from the salted water and place in suitable-sized vessel; add 2 lbs. grated horse-radish, 2 ozs. cloves, 2 ozs. turmeric, ½ lb. peppercorns, 2 ozs. cassia buds, 2 lbs. mustard seed (white), 2 lbs. mustard. Cover with vinegar and, stirring constantly, boil for twenty minutes.

It is best to use wooden knives and forks for all pickle preparations and saucepans lined with earthenware or stone pipkins to boil vinegar in.

Pickled Cauliflowers.

Use the whitest and closest cauliflowers, arrange in small bunches on a suitable tray, cover the bunches with salt, and allow to lie for about three days, so that all the moisture may be drawn from the "flower." Then place in jars and fill with boiling salt and water, allow to lie thus for twelve hours, drain off the salted water, and pack the prepared "flowers" into glass jars; fill with vinegar and cover with close-fitting lids.

J. B.

Block Milk

A NEW form of conserved milk that has recently acquired considerable importance in Germany is that put on the market under the name of "Block Milk." This product is obtained by concentration of the milk and adding about 10 per cent. sugar, so that the production process technically resembles that of condensed and saccharinised liquid milk. The chief difference is that a higher percentage of water is evaporated from the milk that is to be reduced to block form. The mass so obtained is moulded into blocks by compression, and, to protect them from harmful atmospheric effects, a thin coating of cocoa-butter is applied, amounting to approximately 1 per cent of the whole.

Chemical analysis shows block milk to consist of a greyish-white powder, having a fat content of 15 per cent. and a moisture content of 11 per cent. Block milk may thus be regarded as a sweetened milk concentrated to practically perfect dryness and then moulded. In the finished product there is about 40 per cent. sugar.

In Germany the block milk is made up in wooden cases containing five blocks of 10 kg. (22½ lbs.) each. As compared with milk powder, block milk is considered less valuable on account of its high sugar content. Condensed (liquid) milk may be cheaper, but this is because it contains more water and less fat or sugar. Owing to its slight water percentage, greater durability is claimed for block milk than for condensed milk, and the same feature enables it to retain its characteristic properties longer than milk powder.

The chief consumers of block milk are the chocolate factories and the manufacturers of caramel sweets, etc.

(*Milchwirtschaftliches Zentralblatt.*)

(*Continued from p.* 356.)

would like to see a new Food Act embodying the misfeasance of misbranding as well as the subject of adulteration.

Manufacturer versus Consumer.

Last month Mr. Thomas confessed that he criticised my article in a spirit of levity. I must confess that I have treated my critics in the same light-hearted way. I have not seriously tackled the jam, and I have left the bread untouched. I am well aware of the fact that food manufacturers know more about food manufacture than I do. But I still stick to my guns. I still maintain that the consumer should be told the truth. If a manufacturer is supplying the public with a product of high quality, surely he cannot damage his trade by adopting truthful labels. If his factory is clean, and his methods of manufacture are above reproach, is it likely that he will be harmed by telling the public how his products are manufactured? If proper labelling were universally adopted, good firms would maintain their present high position, and bad firms would be gradually weeded out. This would benefit the consumer enormously. Manufacturers may think that my idea is an idle dream, but we live in an age when dreams sometimes come true. Henry Ford dreamed a dream, and his dream came true. He managed to produce a cheap motor-car in spite of the fact that he paid his work people high wages; and his experiment was a great commercial success. I am optimistic enough to hope that there is an equally successful future awaiting the food manufacturer who takes the consumer into his confidence and tells him the truth, the whole truth, and nothing but the truth.

[WE rather fancy that the "jazz" effect of mixing metaphors is quite in keeping with the times.—EDITOR.]

Proposed New Food and Drug Regulations in South Africa.

Draft regulations issued under the Food, Drugs, and Disinfectants Act, 1929, of the Union of South Africa were published in the Government Gazette of July 5. It is expected that these regulations, with such amendments or additions as may be decided on, will come into force simultaneously with the Act on January 1, 1930. These regulations include instructions as to labelling, preservatives and colouring, flavouring and artificial sweetening substances in food.

Sale of Boneless Kippers in Singapore.

A report from August Brauer, Jr., at Singapore, S.S. (dated July 21, 1929), states that the Singapore Cold Storage Company is selling in the local market a quality of boneless kippers, and is advertising this foodstuff very extensively. An important feature of the advertising is the statement that these kippers are wrapped in cellophane paper.

New Australian Marine Industry.

Recently British Marine Industries, London, obtained a lease for twenty-eight years of the Lacapede Islands off the coast of Western Australia for the purpose of the utilisation of by-products from sharks, dugongs, dolphins, turtles, and beche-de-mer. Primary operations will begin in January, 1930, when about fifty hands will be employed at the company's works at Beagle Bay, West Australia.

Aluminium for Canned Foods in Norway.

A most interesting experiment is being made in Norway, which has possibilities of revolutionising the canning industry, inasmuch as it has as its object the replacement of tin with aluminium, according to a report dated September 14, 1929, and received from Marquard H. Lund, at Oslo. At present the experiment is limited to canned fish. Fifty thousand aluminium cans have been made up and used for canned fish balls and other fish products, part of which has been exported.

The present most serious objection is the price, which is considerably higher than tin, but to offset the difference it is pointed out that possibly the expense of the printed label may be done away with, as aluminium may be embossed, because it does not rust. If the question of cost can be satisfactorily solved, there is no question but that aluminium for the canning industry has possibilities.

The Norsk Aluminium Company, Hoyanger, Norway, is supplying the aluminium for these experiments and is backing the project, which, if practical, will provide an entirely new outlet for the aluminium industry. Plans are being made for the installation of rolling equipment at the company's plant at Hoyanger for the special gauge sheets that are required.

Danish Condensed Milk Industry and Trade.

Danish production of condensed and evaporated milk has shown a steady and rather rapid growth during the last ten years. In 1919, production amounted to only 20,680,000 pounds, valued at roughly £340,000, while at present the annual output averages 66,000,000 pounds, valued at more than £1,070,000. While it is improbable that the increase in production will continue at this rate, a steady growth can apparently be expected.

At present the industry embraces twenty-four establishments, employing about 700 people. The great majority of these plants, however, are very small, and produce condensed and dried milk only as a side-line to the operation of a creamery and at irregular intervals. Of the twenty-four plants there are, in fact, only nine which produce condensed milk, and only four are regular producers of dried and evaporated milk. The following four are by far the most important, and in fact the only, plants producing regularly and on a large scale: A/S Den Danske Maelkekondenseringsfabrik, Nakskov; A/S Fredericia Maelkekondenseringsfabrik, Fredericia; A/S Forenede Danske Maelkeexport Kompagni, St. Knudsby, Hjørring; Moens Tørmaelksfabric, Lindeby pr. Stege.

New Cold Storage Plant at Victoria, B. C., Canada.

The cold storage plant known as the Victoria Cold Storage and Terminal Warehouse Company, Ltd., was recently completed at Victoria, and contracts for storage are being made. This plant has recently closed a contract with the Island Packing Company, Ltd., calling for the storage, packing, and shipping of 8,000,000 pounds of fish annually. In addition to the storage of fish, the Victoria Cold Storage and Terminal Company will supply the various needs of the local community for preserving food supplies such as berries, fruit, vegetables, butter, eggs, etc.

Since entering the fishing industry last autumn, the Island Packing Company, Ltd., has installed a plant and equipment valued at about £100,000 for handling pilchard products and other fish. The fish will be brine frozen, filleted, wrapped in wax paper, and enclosed in cartons for distribution.

Canadian Report on Packing.

A bulky 33-page report on the fruit and vegetable packing industry in Canada during 1927 was issued some time ago by the Dominion Bureau of Statistics. This includes canned, dried or evaporated fruits and vegetables, preserved fruits, vinegar, pickles, sauces, and relishes. There were 272 operating plants in Canada, of which 130 were canning fruits and vegetables, 46 preserving fruits, 36 drying or evaporating, and the remainder producing vinegar, cider, pickles, etc. The cost of materials used was 17,212,599 dols., an average of 63,282 dols. per factory. Total value of products made was 30,334,022 dols., or 111,522 dols. per factory. Total net value of production was therefore 13,121,423 dols. Production included the following canned fruits: apples, 108,080 cases; cherries, 39,331 cases; peaches, 77,611; pears, 144,493; plums, 42,249; raspberries, 56,347; strawberries, 50,138; and tomatoes, 1,550,682 cases. The vegetables included beans, 131,205 cases; baked beans, 570,381; corn, 593,353; peas, 984,879 cases. Preserved fruits production (jams, jellies, and marmalades) totalled 8,992,833 lbs. The plants also made 225,652 gallons of catsup and relishes; 137,345 cases canned soups, nearly 7,000 cases canned chicken, and quantities of evaporated apples, apple chop, mincemeat, sauerkraut, 67,500 gals. vinegar, and 48,000 gals. cider.

Oil, Fat, and Allied Industries in Holland.

Oil production in Holland dates from the first half of the seventeenth century, and is now one of the country's foremost industries.

The output for the years 1926 and 1927 was 659,000 and 631,000 tons respectively of oil seed, including approximately 350,000 tons linseed.

Almost two-thirds of the linseed oil obtained was exported. The oil from other seeds is almost entirely utilised for food purposes, chiefly for margarine. There are also considerable imports of crude oil, soya oil ranking first (in 1926, 50,000 and in 1927, 75,000 tons). Half the soya oil shipped to Europe in 1927 was worked in Holland. A large proportion—about 200,000 tons annually—of both home produced and imported oils are refined (deacidified, bleached, deodorised) in the home factories.

The hardening process was introduced into Holland in 1912, and during the last two years the quantities of oil, including train oil, hardened were at least 60,000 and 70,000 tons respectively.

The value of the 189,000 tons vegetable oils and fats exported in 1927 was fl.76,000,000 (£6,333,333), which with fl.33,000,000 (£2,750,000) for hardened and mixed fats make up a total exports value of fl.109,000,000 (£9,083,333).

A large proportion of the oils and fats manufactured finds its way into the margarine industry.

With a very few exceptions this industry is concentrated in the well-known Margarine Unie, the company formed by the merging of the large undertakings of Van den Bergh and Jurgens.

Both these undertakings started in the small village of Oss, where both Simon van den Bergh and Anton Jurgens took up the margarine production shortly after its discovery by Mège Mouries.

Advertising by Aeroplane.

This illustration gives a view of the interior of the Ford aeroplane chartered by Reid, Murdoch, and Co., Chicago, to demonstrate canned and preserved foods. This is claimed to be quite the most up-to-date method of sales promotion which the food industry has yet developed.

American Can Co.

The American Can Company will, on January 1 next, take over the can plant of the Canadian Canners, Limited, at Simcoe, Ontario, Canada, having purchased from the Canadian Canners, Limited, property adjacent to the plant and also other property in Simcoe. Construction of a new can plant is expected to start shortly, to be ready some time in the spring of next year. It is understood that the American Can Company has arranged with the Canadian Canners, Limited, to supply the latter with cans for the outputs of its various canneries.

The Brazilian Foodstuff Market.

Brazilian imports of foodstuffs reach a value of approximately £22,000,000 each year, the bulk of which is supplied by the United States. Although an agricultural country, Brazil's products are of a semi-tropical nature, and it is consequently dependent on outside sources for many of its food requirements.

A brief survey of the Brazilian foodstuffs market, prepared by the American Trade Commissioner, has just been issued by the U.S. Department of Commerce in the form of a trade bulletin.

The report discusses each class of foodstuffs, and indicates the possibilities for developing the market. Complete statistical tables showing Brazil's export and import trade in foodstuffs are included.

Trade News

Spanish International Competition.

It is interesting to note that one of our readers, Mr. T. G. Joyce, of Stourbridge, appeared in the prize list of the Spanish International Competition for his treatise on olive oil. There were 494 competitors and 14 prizes.

	Pesetas.
Dr. E. Lewkowitsch, A.R.C.S. (London)	5,000
Prof. Stephano Fachini (Milan), Dr. G. Dorta (Milan)	4,000
D. J. G. Sarria (Valladolid)	3,000
A. J. Baud (Marseilles), B. Curtois (Lyon)	2,000
D. Fernando S. Gerona (Linares)	2,000
T. G. Joyce, B.Sc., F.I.C. (Stourbridge)	2,000
W. Rhys-Davies, F.I.C., F.R.M.S. (Leeds)	700
D. A. B. Ausejo (Valencia)	700
D. L. Rouvier (Toulouse)	500
D. A. Gazari (Split)	500
D. R. Casares (Malaga)	500
D. S. Burgaleta (Tuleda)	500
D. E. A. Ullan (Palencia)	500
D. J. R. Macho (Palencia)	500

The papers are the property of the National Association of the Olive Growers of Spain, and cannot be published by the author.

W. J. Bush and Co., Ltd., Ash Grove, Hackney, London, E.8.

A comprehensive price list, dated November, 1929, of flavourings, soluble and fruit essences, essential oils, floral ottos and colourings for biscuit manufacturers, manufacturing confectioners, aerated and mineral water manufacturers.

Carrier - Ross Engineering Co., Ltd., Victory House, Regent Street, London.

An attractive booklet describing the Carrier-York Heat-Diffusing Unit for heating factories and other buildings. It is stated that this device warms the shop uniformly to the required temperature within half an hour of starting up, at the same time maintaining a gentle and invigorating air movement throughout the whole of the working zone. This unit is complete with simple automatic temperature control.

The British Thomson-Houston Co., Ltd., Rugby.

This firm has supplied the turbo-alternators and all the electrical equipment of the Padiham and Kearsley power stations. It is interesting to note that with a fuel consumption of 1·33 lb. of coal per unit generated and a thermal efficiency of 21·55 per cent., the former station takes premier place in the Electricity Commissioners' Report for the year ending March 31, 1929. Padiham ranks as the most efficient power station in Great Britain, irrespective of size and output.

Industrial Research.

This was the subject of an address by Dr. F. A. Freeth, F.R.S., on Friday, November 1, to the annual joint meeting of the Society of Chemical Industry, the Institute of Chemistry, the Society of Dyers and Colourists, and the Manchester Literary and Philosophical Society.

Empire Trade.

A meeting of the Council and Vice-Presidents of the British Empire Producers' Organisation was held at Imperial Chemical House, Millbank, S.W. 1, at 3 p.m., on Tuesday, November 12.

Lord Melchett proposed the following resolution: "That, having in mind the desirability of the adoption of a policy of the development of the Empire as an economic unit, this Council recommends that immediate steps be taken to promote the conclusion of extended reciprocal trade agreements between the United Kingdom and the several parts of the Empire overseas."

Craig Patents, Ltd.

Craig Patents, Ltd., of 4, Bow Lane, Cheapside, London, E.C. 4, has recently been formed to act as consultants in Fuel, Mechanical, Electrical, and Production Engineering, Tool Designing, etc., with particular reference to Food Manufacturing and Packing.

English Fruit.

"All will agree as to the superiority of English outdoor or hot-house fruits slowly ripened under our conditions over similar fruits more quickly grown in hot countries. Probably the slower ripening gives an opportunity for something more than the conversion of starch into sugar and the disappearance of tannins; the reactions in which the proteins and amino acids are concerned take place more slowly. Ultimately the maximum of fruit ethers and aromatic substances have been formed, and the substances giving rise to the bitter acid or astringent taste entirely disappeared. Under conditions of high temperature and quick ripening it is conceivable that the starch-sugar transformations which cause the fruit to be regarded as ripe are completed before the changes which produce quality have fully taken place. It is well known, for example, that temperature has an important influence on the rate of oxidation of fruit acids: thus malic acid is oxidised more easily than glucose at all temperatures. Fruits containing it, such as apples, can ripen, therefore, in colder climates quicker than fruits containing tartaric acid, such as grapes. Citric acid is still more resistant to oxidation, and fruits such as oranges and lemons require warmer climates in order to ripen. Now that the transport of fruit from the borders of the Empire has become of such economic importance we have a special low-temperature research station engaged in the study of the problems of its storage: such questions as we raise in connection with quality are fundamental to this enquiry."—*Journal of the Society of Chemical Industry*, October 4, 1929.

Current Literature

Fruit and Vegetable Products

631. A Canned Grapefruit Defect. C. R. Fellers. (*Canner*, 69, 18, 11.)
632. Cost of Canning Tomatoes and Tomato Paste. Report of U.S. Tariff Commission (*Ibid.*, 15.)
633. U.S. Canned Foods Imports. C. H. Beohringer. (*Canner*, 69, 17, 13.)
634. Table and Industrial Syrup. D. S. Glenn. (*Fruit Prod. J.*, 9, 2, 37.)
635. Solid Grape Products. P. H. Richert. (*Ibid.*, 39.)
636. Freezing Fruit in Small Containers. M. A. Joslyn. (*Ibid.*, 41.)
637. Utilisation of Cold Packed Fruits in Frozen Dairy Products. Fellers and Mack. (*Ibid.*, 46.)
638. The Biochemistry of Pectin. A. G. Norman. (*Science Progress*, October, 263.)

Cereal Products

639. Colloid-Chemistry of Gluten. H. L. Bungenberg de Jong and W. J. Klaar. (*Cer. Chem.*, 6, 5, 373.)
640. Moisture Content of Flour and Wheat. T. H. Fairbrother. (*Ibid.*, 379.)
641. Sulphur and Chlorine of Wheat. B. Sullivan and M. Howe. (*Ibid.*, 396.)
642. Plasticity of Flour-Water Suspensions. J. St. John. (*Ibid.*, 400.)
643. Influence of Flour Moisture on Pekar Test. A. W. Alcock and N. J. Ediger. (*Ibid.*, 410.)
644. Baking Tests. C. G. Hamel. (*Ibid.*, 414.)
645. Committee Report on Analysis. M. J. Blish. (*Ibid.*, 423.)
646. Protein Determinations. A. E. Treloar. (*Ibid.*, 429.)
647. Indicators for Ammonia Titrations. L. H. Bailey. (*Ibid.*, 455.)
648. Effect of Storage and Bleachers on Carotin Concentration of Flour. C. G. Ferrari and C. H. Bailey. (*Ibid.*, 457.)
649. Rapid Determination of Moisture in Wheat. E. F. Burton and A. Pitt. (*Canad. J. Res.*, I., 155.)
650. Resistance of Wheat Starch to Diastatic Activity. J. G. Malloch. (*Ibid.*, 111.)
651. Bleaching Flour. A. Lejeune. (*L'Ingenieur Chimiste*, 13, 30.)

Dairy Products

652. Fungi Found in Milk. H. A. Cummins, V. Kennelly, and M. Grimes. (*Sci. Proc. Roy. Dublin Soc.*, 19, 311.)
653. Lactose-fermenting Yeasts Isolated from Milk, Cream, and Butter. (*Ibid.*, 261.)
654. Detection of *B. coli aërogenes* in Milk. K. J. Demeter. (*Milch. Zentr.*, 58, 261, 277, and 293.)
655. Composition of Irish Winter Butter. P. S. Arup. (*Analyst*, November, 1929, 634.)
656. Therapeutic Value of Irradiated Milk in Treatment of Rickets. Watson, Finlay, and King. (*Lancet*, October 5, 704.)

Various

657. When to Add Vinegar in Making Mayonnaise. Gray, Southwick, and Maier. (*Glass Packer*, October, 397.)
658. Sterilisation of Chocolate Milk Drinks. A. G. Osborne. (*Ibid.*, 407.)
659. The Effect of Acidity on the Toxicity of Sodium Benzoate. Cruess, Richert, and Tracy. (*Ibid.*, 413.)
660. Pre-Roasting Treatment of Cacao. R. Whymper. (*Mfg. Conf.*, October, 48.)
661. Determination of Moisture in Milk Powder. S. H. Meihuizen. (*Chem. Weekblad*, 26, 417.)
662. Fiehe's Test for Invert Sugar in Honey. C. A. Greenleaf and C. A. Browne. (*J. Assoc. Off. Agric. Chem.*, 12, 319); also E. K. Nelson (*Ibid.*, 323.)
663. Constituents of Soya-bean. M. E. Holz. (*Seifensieder Ztg.*, No. 13-17.)
664. Cacao Butter. D. W. Horn and A. Osol. (*Amer. J. Pharm.*, 101, 601.)
665. Analysis of Coffee Adulterated by Chick Peas. J. Frézouls (*Ann. Falsif.*, 22, 415.)
666. Micro-determination of Caffeine in Coffee. A. C. Röttinger. (*Mikrochem.*, 1929, Pregl. Fest., 308.)
667. Determination of Gelatin in Dilute Solutions. J. G. Kane and H. E. Watson. (*J. S. C. I.*, 48, 44, 335 T.)
668. Vanillin. L. Mauge. (*L'Industrie Chimique*, 16, 302 and 362.)
669. Piqui-a Fruit Oil. C. D. V. Georgi. (*Malayan Agri. J.*, 17, 166.)
670. Dry Matter in Vinegar. G. Dona. (*Giornale di chimica industriale*, 11, 264.)
671. Dried Egg Products in Ice Cream. W. S. Mueller and F. C. Button. (*J. Dairy Science*, 12, 320.)
672. Behaviour of Nutrients and Foodstuffs at High Oxidation Potentials. J. Tillmans and G. Hollatz. (*Z. Unters. Lebensm.*, 57, 489.)
673. Heat Penetration Studies of Chocolate Milk. A. G. Osborne. (*Glass Container*, 8, 12, 18.)
674. Floating Factories. Hauptvogel. (*Chem. Zeit.*, October, 786 and 806.)
675. Vitamin-B in Dried Yeast. A. Scheunert and M. Schieblich. (*Biochem. Zeit.*, Vol. 213, Parts 1-3, 220.)
676. Physics of Ice-Cream. Leighton, Williams, and Kurtz. (*J. Physical Chem.*, October, 1481, 1484, and 1489.
677. Determination of Boron in Food and Drugs. A. S. Dodd. (*Analyst*, November, 1929, 645.)
678. Determination of Minute Amounts of Copper. T. Callan and J. A. R. Henderson. (*Ibid.*, 650.)
679. Invertase from Honey. P. E. Papadakis. (*J. Biol, Chem.*, 83, 561.)

Commercial and Legal News

(The Editor does not accept responsibility for any errors which may occur in the following notices.)

London Gazette Information

Voluntary Liquidations

Voluntary liquidations may, in some instances, refer to companies in course of reconstruction.

THE BUTTS BREWERY, LIMITED. Resolved, October 14, that the company be wound up voluntarily, and that Mr. J. T. Bunch, C.A., Bridge Street, Walsall, be appointed liquidator. (NOTE.—All debts of the company have been, or will be, paid in full.)

THE WHITTLE SPRINGS BREWERY, LIMITED (in voluntary liquidation). A general meeting of the members of this company will be held at Lion Brewery, Blackburn, on December 4, at 3 p.m., to receive the report of the liquidator showing how the winding-up has been effected.

THE WATERLOO BOTTLING COMPANY, LIMITED. A general meeting of the members of this company will be held at 24-25, Great Tower Street, E.C., on December 9, at 12 noon, to receive the report of the liquidator showing how the winding-up has been conducted. Liquidator: Mr. C. E. Osborn.

OLD CHELSEA LIQUEURS, LIMITED (in voluntary liquidation). Old company registered in 1921. A general meeting of the members of this company will be held at 19-21, Speke Road, S.W. 11, on December 12, at 4 p.m., to receive the report of the liquidator showing how the winding-up has been effected. Liquidator: Mr. F. Farmer. (NOTE.—This notice refers solely to the company of this name registered in 1921.)

BENTLEY'S MILNSHAW BREWERY COMPANY, LIMITED (in voluntary liquidation). A general meeting of the members of this company will be held at 2, Mount Street, Manchester, on December 10, at 10.30 a.m., to receive the report of the liquidator showing how the winding-up has been effected. Liquidator: Mr. A. Weaver.

THE HAMWORTHY PRESERVING COMPANY, LIMITED (in voluntary liquidation). A general meeting of the members of this company will be held at 102, High Street, Poole, on December 16, at 3 p.m., to receive the report of the liquidator showing how the winding-up has been effected. Liquidator: Mr. E. J. Pearce.

Bankruptcy Acts

Order made on Application for Discharge.

CHIPPERFIELD, GEORGE, late 213, High Street, Sutton, Surrey, Dairyman. (10 of 1920.) Order made October 16, 1929: Bankrupt's discharge suspended for two years and that he be discharged as from October 16, 1931.

Notice of Dividend.

ANDREWS, JOSEPH HENRY, trading under the style of GEORGE E. ANDREWS AND SON, and carrying on business at Smithfield Road, Shrewsbury. Mineral Water Manufacturer and Bottler. (8 of 1923.) Supplemental dividend of 2d. per £, payable November 5, 1929, at Official Receiver's Offices, 22, Swan Hill, Shrewsbury.

Companies Acts

Notice of Dividend.

THE KANDY TEA COMPANY, LIMITED, 35-37, Dickinson Street, Manchester. (6 of 1927.) Supplemental dividend of 1¾d. per £, payable October 28th, 1929, at Official Receiver's Offices, Byrom Street, Manchester.

New Companies

E. A. MARTIN AND COMPANY (NORTH SHIELDS), LIMITED. (243240.) Tanners Bank, North Shields. To take over the bus. of a sausage mnfr. cd. on at Killingworth Place, Newcastle-on-Tyne, by E. A. Martin. Nom. Cap.: £5,000 in £1 shares.

CONSERVES PRODUCTS, LIMITED. (243208.) To carry on the bus. of refreshment contractors, restaurant keepers, etc. Nom. Cap: £2,000 in £1 shares.

SLADES (1929), LIMITED. (243294.) St. Peter Street, Maidstone. To carry on the bus. of mnfrs. of and dlrs. in sweets and confectionery, etc. Nom. Cap.: £100 in £1 shares.

ALEXANDER ROSE (CONFECTIONER), LIMITED. (243352.) To take over the bus. of wholesale confectioners cd. on at Hoyland Nether, nr. Barnsley, by Ann M. Rose and D. R. Rose. Nom. Cap.: £1,000 in £1 shares.

LAZENBY AND RIDGEWELL, LIMITED. (243392.) 9-10, Great Tower Street, E.C. 3. To carry on the bus. of produce and genl. mchts., dlrs. in raw materials, juices, pulps, preserved and fresh fruit, etc., Nom. Cap.: £2,000 in £1 shares.

A. G. PORTER, LIMITED. (243322.) Coopers Buildings, 12, Church Street, Liverpool. To carry on the bus. of wholesale or retail dlrs. in foodstuffs of all kinds, etc. Nom. Cap.: £5,000 in £1 shares.

MAISON ROBERTS, LIMITED. (243393.) To carry on bus. as mnfrs. of and dlrs. in chocolates and refreshments, etc. Nom. Cap. £1,000 in £1 shares.

WM. FAIRBAIRN (HANLEY), LIMITED. (243454.) Stafford Lane, Hanley. To take over the bus. of grocers and provn. mchts. cd. on at Hanley as "Wm. Fairbairn." Nom. Cap.: £1,500 in £1 shares.

H. PERCIVAL (FISH MERCHANTS), LIMITED. (243548.) To carry on bus. as indicated by the title. Nom. Cap.: £2,000 in £1 shares.

DARRACOTTS, LIMITED. (243539.) To take over the bus. of bakers, etc., cd. on at Aldershot and elsewhere as "Darracotts." Nom. Cap.: £8,000 in £1 shares.

F. AYERS AND SONS, LIMITED. (243544.) 71, Woodbridge Road, Guildford, Surrey. To carry on the bus. of pastrycooks, confectioners, etc. Nom. Cap.: £10,000 in £1 shares.

(*Continued from p.* 346.)

with alkalis, followed by physical processes, such as heating with super-heated steam under great pressure, filtration under pressure, etc., and super-cooling, has of necessity to be adopted in place of bleaching, etc. In all cases the percentage of free fatty acids must be brought down to an absolute minimum.

Sesame and Arachis Oils.

Under German Law sesame oil has to be used in the manufacture of margarine. This is done in order to facilitate its detection in German butter—margarine containing sesame oil giving a characteristic reaction in the Baudouin test.

Sesame oil is expressed from the seeds of the sesame plant, which is indigenous to India and the East generally. The seeds are generally shipped to the large oil refineries on the Continent. The percentage of oil obtainable is in the vicinity of 45 to 50 per cent. The finest cold-pressed oil is a light straw colour, possessing a slight but characteristic smell and a pleasant taste.

Owing to the ease with which sesame oil can be detected, its wholesale use as an adulterant is not regarded favourably by "up-to-date" manufacturers.

Lewkowitsch (*Oils, Fats, and Waxes*) gives the following physical and chemical constants:

Specific gravity, 0·9230 to 0·9237; saponification value, 196·6; iodine value, 106; Hehner value, 95·86.

Arachis is a very popular oil in the foodstuff industries generally. It is obtained from pea—or earth—nut, grown in India, the West Coast of Africa, North America, etc. Lewkowitsch gives the following description of the extraction of the oil:

"The nuts are first shelled by special machinery, and the inner or red skin which surrounds the kernel is removed as completely as possible by a blast of air, in a manner similar to that employed for cleaning wheat in flour mills. The separated and cleaned kernels are then ground and subjected to hydraulic pressure. Since the kernels contain from 43 to 45 per cent. of oil, expression of the oil is carried out in two stages."

The very finest "cold-drawn" oil is colourless and possesses a pleasant "kidney-bean" taste. It is much used for general food purposes, such as manufacture of salad oils and dressings. De Negri and Fabis give the following analytical constants for this oil: Specific gravity, 0·917; saponification value, 190·2; iodine value, 95 to 95·4. (The saponification value for the purest oil is generally a little lower; a mean average may be said to be 189.)

(*Continued from p.* 359.)

Japanese business man, in short, is a slippery customer, ready to do anything for money, provided he does not endanger his personal liberty. Gaol is the only thing he fears.

Recently, an Australian traveller visited Japan, doing particularly well with various canned specialities. He endeared himself to dealers by picking up a smattering of the vernacular.

(*Continued from next page.*)

317,403. **Conveyers.** FULLER CO., Catasauqua, Pennsylvania, U.S.A..—(Assignees of Morrow, J. H.; Catasauqua, Pennsylvania, U.S.A.)

317,128. **Blending tea, etc.** BERGH, H. E. VAN DEN, 9, Beech Street, Barbican, London.

317,096. **Packeting tablets.** SCHUITEMA, A., 451, Keizersgracht, Amsterdam.

317,074. **Conveyers.** CLAGHORN, C. R., 715, Continental Building, Baltimore, U.S.A.

316,959. **Centrifugal machines.** WAIT, E. G., 14, Semley Road, Norbury, London.

316,922. **Grinding, crushing, etc., mills.** LIVINGSTONE, H. A., 88, Marlborough Avenue, Kingston-on-Hull.

Recent Trade Marks

This list of Trade Marks of interest to readers has been selected from the Official Trade Marks Journal, and is published by permission of the Controller of H.M. Stationery Office.

GRANNIE'S

506,152. **Peas for food.** JOSEPH BLOWER DRING, The Model Factory, Norfolk Street, Boston, Lincolnshire. Nov. 6.

GOLDEN CORN

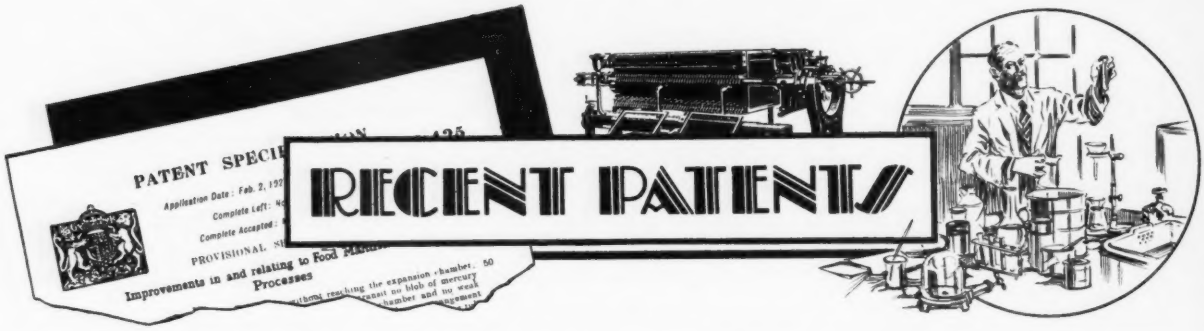
505,400. **Custard powder and jellies (for food).** JOSEPH SALZEDO, 48, Blenheim Gardens, London, N.W. 2. Nov. 6.

POLION

502,899. **Butter.** POLISH TRADING CO., LIMITED, 123, Cannon Street, London, E.C. 4. Oct. 23.

ZENITH

503,189. **Margarine.** NAAMLOOZE VENNOOTSCHAP BLOEMENDAL AND KERKHOVEN'S FABRIEKEN, 47, Fabriekstraat, Rotterdam, Holland. Oct. 23.



These particulars of New Patents of interest to readers have been selected from the Official Journal of Patents, and are published by permission of the Controller of H.M. Stationery Office.

Latest Patent Applications

34215. CLIFTON, W. E.: Manufacture of coffee. Nov. 6.

34180. DALL'ARMY, J. VON: Treating animal milk. Nov. 8.

34017. MODERN FOOD PROCESS CO.: Sausage products, Nov. 7.

32421. COX, WILCOX AND CO., LIMITED, AND JONES, E. H.: Food covers. Oct. 25.

32101. LANGEMEYER, C.: Manufacture of yeast. Oct. 22.

Specifications Published

300,209. REEH, J. E. W.: Refrigeration of products such as foodstuffs.

320,369. KORSELT, DR. J.: Manufacture of juices, rich in vitamins, from plants.

302,338. MONTAN UND INDUSTRIALWERKE VORM, J. D. STARK: Process for the production of citric acid by fermentation.

320,497. POHLMANN, J., AND RASSERS, J. R. F.: Preparation of milk, skimmed milk, or buttermilk, free of milk-sugar, for sufferers from diabetes.

Printed copies of the full Published Specifications may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, at the uniform price of 1s. each.

Abstracts Published

319,529. **Fish preparations.** EGGE, H. J., 17, Middelthunsgate, Oslo, Norway.

For producing an edible paste from the liver of codfish, etc., the liver is first heated with one or more diluted weak or strong acids—for example, with vinegar—and is then disintegrated to a fine paste and cooked under non-oxidising conditions. Ovalbumen, casein, and/or milk powder may be mixed with the paste, and spices may be added, and the mass is put into tins which are sealed and subjected to cooking temperature, preferably under pressure. After the removal of the oxidised oils, and before disintegration of the liver, further oxidation of oil may be prevented by a gentle heating of the liver to 70° C. or more.

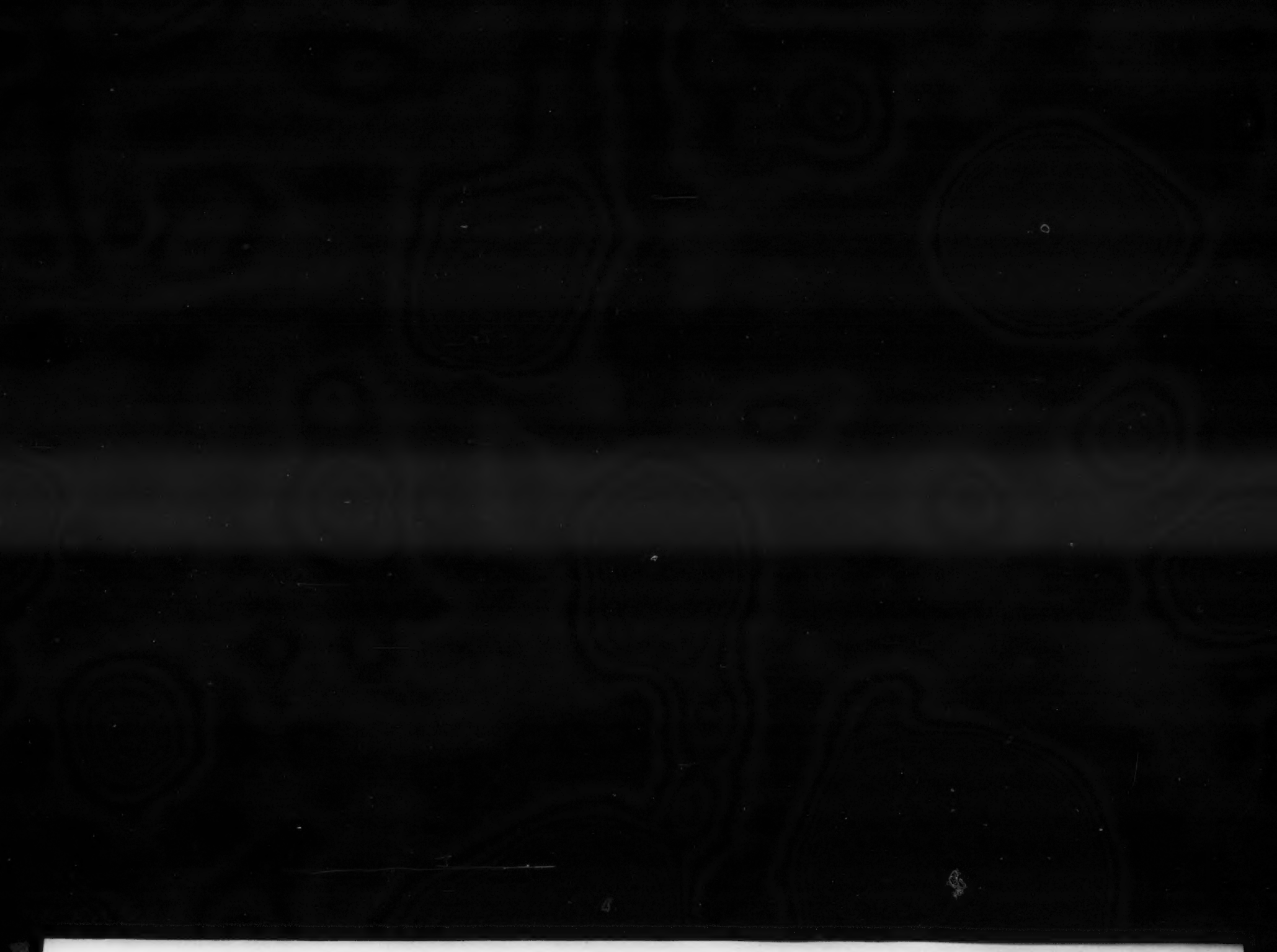
319,440. **Dummy articles for advertising.** VICARS, LIMITED, T. AND T. AND COLLINGE, R. A., Earlstown, Newton-le-Willows, Lancashire.

A replica biscuit or chocolate for advertising is made from a mixture of gutta-percha and sawdust. French chalk, plaster of Paris, and colouring matter may be added as found necessary to imitate various biscuit or other doughs. The completed article may be sprinkled with powdered glass to imitate sugar, or washed with a solution of gutta-percha in carbon bisulphide to imitate cream, or with the addition of "process white" to imitate icing. A jam filling may be imitated by using a mixture of gum, collodion, plaster of Paris, and a base colour. The gutta-percha is softened in hot water, mixed with the sawdust, and kneaded, finally being dusted with the remaining products and re-rolled.

318,388. **Butter, etc., honey preparations.** DEHN, F. B., 103, Kingsway, London.—(Honey-Butter Co., 552, South Figueroa Street, Los Angeles, U.S.A.)

A food product of the nature of butter, and formed by the intimate admixture of honey with butter or butter substitute, is made by preparing a solution of agar, gelatine, or similar blending agent, mixing this solution with honey in syrup form, adding the mixture thus obtained to unmelted butter or butter substitute, and then agitating and mixing the mass at a temperature not exceeding the melting-point of the fat until a solid homogeneous substance is obtained. The mixture of blending agent and honey may be heated under vacuum for the purpose of removing water. The honey may be natural or artificial.

316,091. **Sausages.** Stephens, A. J., 285, High Holborn, London. — (Naamlooze Vennootschap Nederlandsche Parasinfabrieken Amstenrade, Holland.)

Artificial sausage casings are made by impregnating silk fabric with finely ground fresh flesh substances—*e.g.*, meat or skin sinews—ice being added to the flesh substances during the grinding and stirring. Ammonia, sal-ammoniac, or the like may also be added to facilitate and intensify the smoking. The temperature of the mass may be further lowered during grinding by adding cooking salt. The mass may be thinned with blood plasm and blood serum. The impregnated fabric may be immersed in a water-absorbing substance and finally coated with wax or fat.

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